



COMPUTER WEEKLY

US computer fraud Bill 'technically unsound'

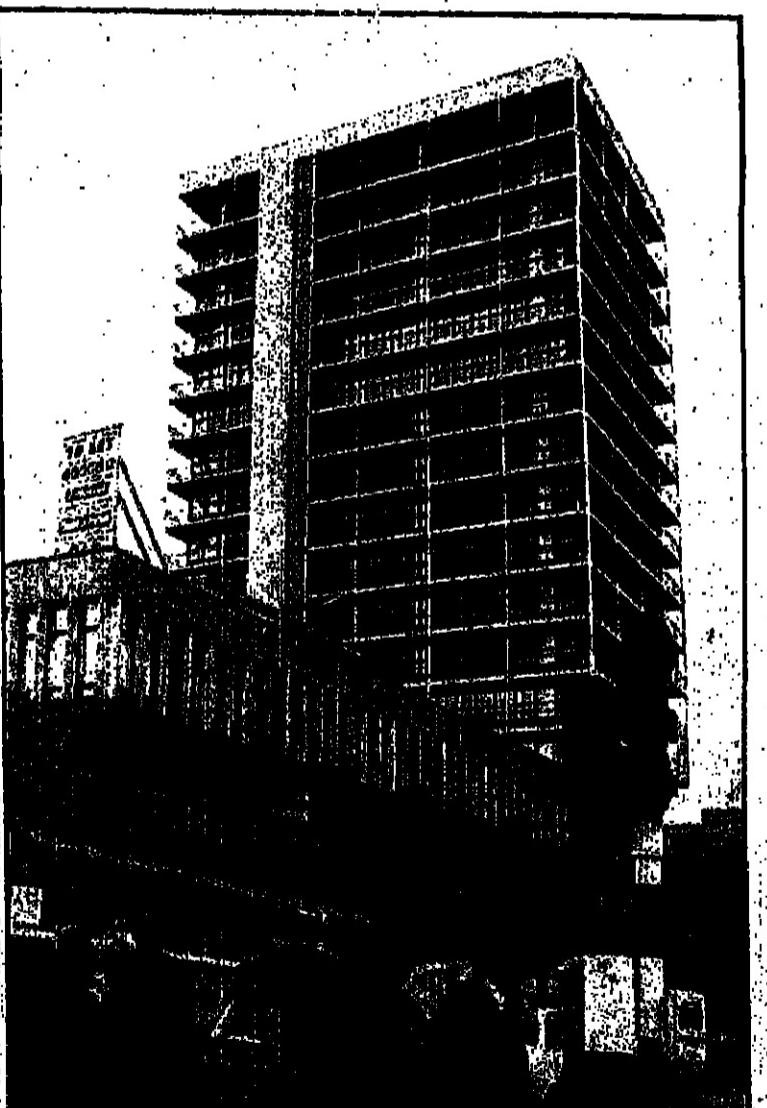
'Police chief sold criminal data' claim

A POLICE chief in Wheaton, Illinois, has been accused of selling criminal records from the State's police computer to a private transport company for use in screening job applicants.

In a series of articles, the Wheaton Daily Journal alleged that Donald Sacramento had taken criminal histories from LEADS, the Law Enforcement Agencies Data System, and sold them to Riss International of Kansas City, Missouri.

The case at present is being considered by a grand jury.

Yesterday's branch office



Branch office of the future, but available now — that's the Model 745 Portable, from the "Silent 700" series of electronic data terminals. It gives representatives immediate access to computerised data wherever there's a telephone and power point.

Just plug it in, link it to a phone handset and the 745 is ready to send or receive up-to-the-minute data. You can then make instant decisions based on reliable, accurate information.

In your customers' offices, for instance, the 745 can enter sales orders or print out complete reports in seconds on your stock, delivery times, prices or detailed quotations.

You can buy the 745 at attractive prices, or use our flexible leasing programme. And you can depend on responsive support from TI's national sales force with additional back-up from its distributor, TI Supply. To handle small quantity immediate deliveries.

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It's all right world, we're only programming

IT IS very easy for computer professionals to become so wrapped up in the delights of their technology that they forget about the ends, for which computers are only the means.

Yet computers can be as lethal as a gun or as beneficial as a brain surgeon and the computer professional who designs the system should not be absolved from some responsibility for its effect.

This concern should extend to informing and alerting "the outside world" to the effect of the technology.

The question of responsibility is most graphically illustrated by major systems which enter the political arena. The US government, for example, has stated that it regards some computers in the same category as military weapons, and has banned the sale of certain systems to certain regimes like South Africa and some South American countries, where it is believed they may be used to infringe human rights.

DP history of the last 15 years is one of great technical advancement but often poor application of the technology. Poorly designed and implemented systems have been the norm rather

than the exception.

Yet this would have been less likely to happen if DP professionals, particularly programmers and analysts, had been made to face up directly to their responsibilities to their users.

DP people tend to feel more of loyalty to their technology than to their users; staff drift to the more interesting technical jobs rather than to the ones with the most appealing applications.

Sitting and programming in ivory tower might be a comfortable way of life but it is time for the computer professional to open up the technological "secrets" as quickly as possible before the tower is stormed.

It is in this context that the Saturday "fun event" at BCS 79 (this page), aimed at children and teachers is to be welcomed. The BCS has often been criticised for its contribution to ivory tower building but it has always shown a strong concern for the impact of the technology and its latest venture deserves widespread support.

Taking computers a mass audience

LOW-PRICED accommodation in central London plus an adventurous programme promise to make the BCS 79 conference, Living With Computing, one of the most popular computing events for some time.

The ACM will be organising a specialist session on the social impact of computing, which aims to take discuss about the effects of information technology beyond the general level of recent discussions towards examining one spec-

ific area.

On the preceding two days, specialist groups will be providing a variety of talks and presentations in three groups.

The ACM will be orga-

nising

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'GROWTH of the UK computer and electronics industries has been seriously impeded by Post Office policy, Tory MPs were told at the third meeting of the Conservative Computer Forum.'

Expert speakers expressed the view that the Post Office's failure to introduce advanced switching equipment meant that only inferior equipment, that cannot be exported, is manufactured here. They also claimed that the Post Office's monopoly had restricted the growth of computer communications.

Derrol Broome, former head of CTI, pointed out that the Post Office's yearly expenditure on telecommunications equipment is £600 million — more than the whole of the computer manufacturers' sales in this country. By continuing to order outdated Strowger exchange gear, the Post Office has prevented Plessey, GEC, and STC from developing modern products that could

'Impeded by PO policy'

competes in overseas markets, he said.

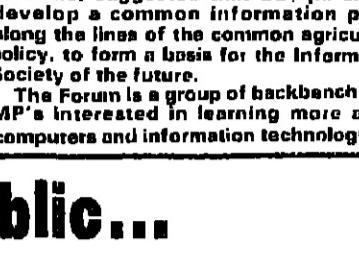
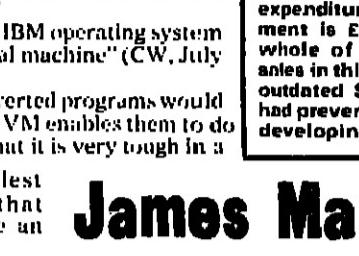
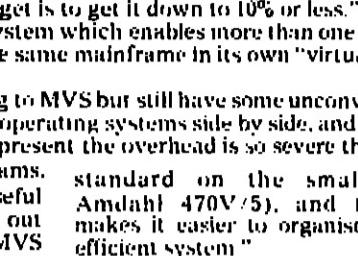
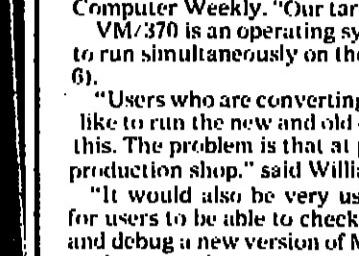
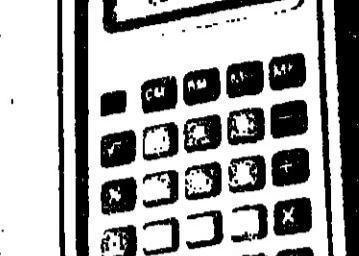
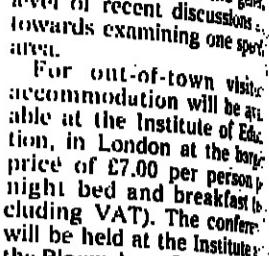
Broome claimed that lack of accountability accounted for the PO's failure to develop progressive policy. He recommended that its monopoly be transferred to a Parliamentary agency which would licence the Post Office or any others it saw fit. He also asserted that Parliament badly needed independent technical advice and that a body outside the UK, such as Western Electric, should be commissioned to carry out a study.

Arthur Norman, consultant from Arthur D. Little, suggested that Europe should develop a common information policy along the lines of the common agricultural policy, to form a basis for the Information Society of the future.

The Forum is a group of backbench Tory MP's interested in learning more about computers and information technology.

BCS 79

Living
with
Computing



audience with the three-day show culminating on Saturday, January 8 with a Computing Fun Fair aimed at a mass audience, particularly teachers

For busy executives, a combined calculator and pocket-sized dictating machine has been introduced to the UK by Toshiba. Pictured here, the dictating machine uses standard 30-minute cassette tapes, has a cue feature, and can run off batteries or mains.

The calculator has a liquid display, memory, and four functions plus square root and per cent.

The whole machine is called the KT-1360, and costs £109 plus VAT.

ELECTRON FREE INFORMATION SERVICE FOR MANAGERS AND ENGINEERS IN ELECTRONICS

which gets the rough edge of the data stick. Shortages, in the main, are at a primary level of operators and programmers, and are a direct result of the earlier unenlightened times.

Training DP industry recruits has always been a bugbear which few installations can afford to undertake. By tradition, such training is left to the larger computer users such as the Post Office, banks, insurance companies and government. The mainframe manufacturers also contribute a healthy surplus to the balance of personnel surplus to plus.

But these accepted entry methods are obviously not sufficient. A new entrant policy needs to be formulated with full-scale integration between education authorities, the government and the industry. A training scheme as recommended (CW, January 19), perhaps triggered by a Noddy party, is now even more urgent.

As ever, it is DP management

that is DP management

DOWNTIME

by Chad

Talk-back at TV

I'm not sure that either the BBC or the BIA would approve of a new system being run by a Mr Roger D. Percy, in Seattle, for he has developed a scheme that allows viewers to "talk back" at the TV.

The "talking" currently has an extremely limited vocabulary, as each viewer can press one of only six buttons on a terminal to register the full gamut of emotional responses from ultimate joy to total despair.

At the moment, Mr. Percy has 35 families hooked up to the system, and is planning to increase this to 200.

Both the terminal and the TV are connected to a central computer system which moni-

Fall in the value of labour will require heavy taxation

tors the amount of time the TV is on, what channel it is tuned to, and what button has been pushed.

Mr. Percy is, I understand, marketing a service based on the system to such companies as General Foods and Sears Roebuck as a market response analysis on TV programmes, advertisements and personalities. Viewers have the option of turning off the TV to register the ultimate protest.

IN taking issue with Derrick Grover (CW, May 25) over some of the points in his article I do not wish to detract from most of his analysis or his main theme—that we should look at a reduction in the cost of labour to solve the problem of technological unemployment. With the urgency of the present problem it cannot be stressed too often that this possibility has not had the attention it deserves, particularly among professional economists.

As C. G. Brainer points out there has been some work on negative income tax which can have the effect of allowing people to work and enjoy a reasonable standard of living even when the value of their labour is relatively low. Unfortunately, the economists that have done this work tend to be right wing and so tacitly agree with what Milton Friedman calls the liberal principle. This states that individuals are entitled to the product of their labour and the product of the goods that they own.

Any attempt to tax the rich to pay the poor violates this principle so right-wingers would naturally be reluctant to agree with the large dose of negative income tax that will be needed to prevent large scale technological unemployment because negative taxes for the poor means high taxes for the rich.

It turned out, however, he was wrong; courts cannot accept plastic money and the hungover lady had to pay with paper instead.

Plastic money is still looked down upon in many circles, as when we still had gold; surely electronic money will have the same problem?

Heve it is a very reputable company, and I think we can take a chance."

It turned out, however, he was wrong; courts cannot accept plastic money and the hungover lady had to pay with paper instead.

The magistrate replied: "It is not a matter for me, but I be-

Colourful launch

HEWLETT PACKARD claims to be concerned over de-Americanising its literature. At the launch of its small business system, the HP250, the company sported specially-produced special announcement HP250 files and proudly spoke of Amplifying a demonstration program. "We removed references to Fancy Seat in the bicycle-spares program, but it appears we forgot Zip Code."

When later questioned about the optional colours available for housing, HP ultimately strove to point out "sweet potato". In fact a red. A representative from HP Germany had been equally worried over colouring; he suggested salesmen would equip themselves with dark hints about the monopolistic effect of unemployment benefit on the labour market.

This brings me to the first point that I wish to make about Grover's article which concerns his statement that industry ultimately pays for unemployment benefit. In one sense this is correct but industry is merely an intermediary; it takes labour

a considerable amount of taxation.

Secondly, I wish to take issue with Grover's claim that labour subsidies can only be a short-term measure and cannot perform any long-term function.

Whether they are the best methods to produce a long-term effect is a matter for further discussion. That they could pro-

duce a long-term effect by altering the accounting done by an employer is surely beyond doubt.

Indeed, given that market forces, and government controls, if necessary, can prevent industry from simply adding the economic concept of the elasticity of demand for labour. This is a measure of the increase in the demand for labour that would be brought about by a decrease in its cost. Given that there are about 25 million workers in the country and an average wage is about £80 per week, we may calculate from Table 1 the blanket subsidy needed to create one million extra jobs.

ough employment to save money on unemployment benefit that is spent on the subsidies recently as last year an article by John Burton, principal lecturer in economics at Kingston Polytechnic, with a review of cases for and against labour subsidies appeared in the National Westminster Bank Review.

Criticism that can be made of this article is its unrealistically high estimate of the cost of a blanket employment subsidy, and the fact that it did not attempt to analyse the effect of raising taxes to offset the cost of the subsidy.

"Prime continues to generate very strong booking gains," comments the broking house.

"The company is gaining more visibility in the end-user marketplace with its excellent hardware and the best operating system in the industry."

A crude model of the effect of a blanket employment subsidy can be constructed using the economic concept of the elasticity of demand for labour. This is a measure of the increase in the demand for labour that would be brought about by a decrease in its cost. Given that there are about 25 million workers in the country and an average wage is about £80 per week, we may calculate from Table 1 the blanket subsidy needed to create one million extra jobs.

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'Cyber 170 is our product line for 1980s' says Control Data

FOR company sometimes predicted as the next casualty in the mainframe computer business, Control Data is doing extraordinarily good business with its Cyber 170 large-scale mainframe product line — and making money out of it.

"Overall our systems business is as profitable as our peripherals and services business," says John Titsworth, executive vice-president for systems at Control Data. "People questioned the need for ever more processing power, but the models at the top of the line, the new 175-100, 200 and 300, the 176 are sold out through the first quarter of 1978. We have shipped over 200 Cyber 170s since July 1975, and are scheduled to ship about 100 this year."

"Orders are currently 30% up on last year and our backlog is up by 10%."

The Cyber 170 line starts at the 171, rated at about the same power as an IBM 370/148, and the top-end Cyber 176 is claimed to be 25 times as powerful.

"A 175-300 offers more power at the same price as IBM's 3033. When running a 70% scientific, 30% business application mix, a 175-300 rates 7½ times a 171, where a 3033 rates only five times. A 176 is about three times as powerful as a 3033."

The line represents a major effort on CDC's part to bring together and harmonise its mainframe operating systems. Two are offered on the Cyber 170 line: NOS, Network Operating System, and NOS Batch Environment. NOS is an improved version of the Kronos operating system introduced on the 6400, and NOS-BE follows on from Scope, which came in with the 8000.

"NOS is designed for heavy interactive time-sharing usage, and NOS-BE is of course primarily for batch working. But the two are becoming more compatible and will be merged into a single operating system," says Titsworth. "The name may change, but the Cyber 170 is our product line for the 1980s."

Two years ago Control Data was talking about moving further into the general purpose mainframe market.

"We are strong in the scientific processing market and always have been," says Titsworth. "But our users want to run their business applications on our machines as well. Indeed we have one West Coast customer who runs a 70% business-30% scientific mix on a Cyber 170, and in Europe, customers like the Danish PTT, and banks in France and Spain run 100% commercial

applications on 170s."

The Cybers are 60-bit word machines with up to 256 Kwords of main memory. On the 176, fast bipolar memory is used, giving a transfer rate of 27.5 nanoseconds for one word. Extended core storage of 512K, one or two Megawords, can be

Comments Titsworth, "Ford is using one for work on engineering structures, and in nuclear research."

The 170 line as a whole is cornering the market in the high technology end of the petroleum industry, and in large power management systems for electricity companies.

The legendary New York blackout last summer brought home the need for such systems to electric utilities. Even so, says Titsworth, fewer than two dozen of the 3082 electricity suppliers have such systems.

The systems offered by Control Data require a dual Cyber installation and cost up to \$100 million.

The education market is also important for Control Data, and 13 universities which have never previously used CDC computers have installed Cyber 170s, and in manufacturing, 15 new users, including GE and Rockwell have put in Cyber 170s. "Overall, 25-30% of orders have come from new customers," notes Titsworth.

The experiment of charging customers according to the use they make of software packages — "usage pricing" — has yet to be evaluated, but CDC recognised early the growing value of software and charges all software separately.

The most obvious requirement from the enormous processing power of the 176 is weather forecasting, but they are also being used in seismic applications — "one major oil company wants two 176s."

A

satellites is to be handled by a new Univac 1100/22 system to be installed at the National Aeronautics and Space Administration's Goddard Space Flight Centre in Maryland.

The 1100/22 will be funded by five Univac V77/64 minicomputers, and the contract is worth \$4.98 million in total.



By TIM PALMER

Univac wins \$30m orders for 1100s

Cameron Davis reports from Washington

ORDERS totalling over \$30 million for large-scale 1100 systems have been announced by Univac. The orders come from Japan, Spain and the US.

In Japan, an \$11.4 million 1100/82 system is to be built by the Kyushu District Agricultural Co-operative, to handle banking and credit requirements.

The 1100/82 system is to be built by the Kyushu District Agricultural Co-operative, to handle banking and credit requirements.

In Spain, where Univac has

a larger share of the market than in most European countries, an IBM 360/40 at the Banco de Crédito in Madrid, which already has two 1100s,

an 1100/42.

The two-year-old promise by a US Congressional committee for a "basement-to-attic" overhaul of America's 1934 Communications Act has been fulfilled. And with its fulfilment has come another promise: sweeping changes will be made to the country's telecommunications policy and the industry structure.

The newly-proposed legislation would adopt, as official federal policy, open competition in the provision of all communications services. Among the Bill's major provisions are de-regulation of the communications industry; the ability for common carriers to provide non-telecommunications services through separate subsidiary; the severance of equipment manufacturing operations from any common carrier that offers non-competitive telecommunications services; and replacement of the Federal Communications Commission by a smaller, more streamlined commission.

Further, the newly-created

National Telecommunications

Commission

will be created.

The Bill would mandate two major reorganisations within the US government. The FCC would be abolished, and in its stead would be a Communications Regulatory Commission. The new body would have 25 percent fewer supporting staff members than presently serve on the FCC.

As well as doing good busi-

ness with large systems, CDC

is a major user of its own

mainframes in its services

business, and this will expand

with the growth of the Plato

educational system. "They also

help us to sell a large number

of peripherals," says Titsworth.

The systems business con-

trasts with the rest of CDC's

activities in that it is predominantly foreign. Some 40%

is done in Europe, 20% in the

rest of the world — including

two Cyber 172s to the People's

Republic of China for oil ex-

ploration applications — and

only 40% in the US. CDC is

The legislative proposal was introduced in the House of Representatives last month by California Congressman Lionel van Deerlin, chairman of the Communications Sub-committee, and Florida Congressman Louis Frey, the ranking Republican members on the committee. Van Deerlin explained to his congressional colleagues that the proposed Communications Act of 1978 would regulate the telecommunications industry "only to the extent that marketplace forces are deficient."

The Bill would make competition fuller and fairer, the sponsoring congressmen claim. The proposal would allow "any common carrier" to provide any service which the new CRC deems telecommunications-related, if the service is offered through a separate subsidiary.

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The two national US committees make up the balance. Another 1100/42 is replacing a 360/64 at a Control Data 6800 at the National Oceanic and Atmospheric Administration, which will be used for marine geodetic data systems, and to produce economic reports for the National Marine Fisheries Service. Worth \$9.1 million, it is to be installed in September, and conversion is due to be completed early in 1979.

Communications for 38 active satellites is to be handled by a new Univac 1100/22 system to be installed at the National Aeronautics and Space Administration's Goddard Space Flight Centre in Maryland.

The 1100/22 will be funded by five Univac V77/64 minicomputers, and the contract is worth \$4.98 million in total.

The new banking terminal

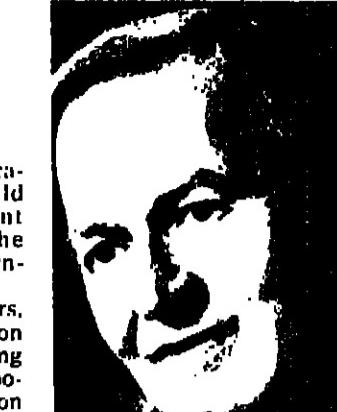
system is called the D16/10, and

is built around a new Datastar processor based on the company's D5 minicomputer. By contrast the new D16/30 business

system uses a Computer

Customer for the Alfaskops is S. Hilton of Preston, UK distributor for the high-quality carpets manufactured by Ege Taepet of Denmark. The terminals are used for stock queries and order processing.

US Bill to reshape the comms industry



VAN DEERLIN . . . legislative proposal introduced in the House of Representatives.

Three new models of Level 6 mini now available in UK

ANNOUNCED four months ago in the US (CW, March 3) three new models of the Level 6 minicomputer are now available in the UK.

The new machines are at the top of the line, and consist of the Model 43, which is little different from the 643 it replaces; the Model 47, which adds facilities to the Model 43 which make it particularly effective in commercial applications; and the high-performance general purpose Model 53.

Honeywell is offering 16K-bit memory chips on the Level 6 line, and the eight memory slots in the chassis will now accommodate a Megaword on main storage.

Disc drives with 256 and 128 Megabytes capacity have been added, which carry 12-disc packs as well as the existing 6-disc units. A double-sided diskette unit completes the introduction, and some Level 6 cartridge disc drives have been reduced in price by about 25%.

The Model 43 starts at £5,500, the 47 and 53 at £14,000; the two high capacity drives cost £21,300 and £18,000 respectively; and the diskette drive costs £1,600.

Wang small mainframe launch

THE new Wang 2200 VS small mainframe has now been formally announced for the UK market, and for convenience has been packaged into three basic configurations, designated WCS/50, WCS/60 and WCS/80.

The machine is claimed to be the only processor in its class with a true virtual storage operating system, and to cover the performance range between IBM's System 34 and 370/135 machines (CW, June 22).

Principal target for the new Wang machine is likely to be IBM System 3 users wanting to move to interactive computing, and the machine will compete with DEC's PDP-11 line through to the 11/70, with the Data General Eclipse and Hewlett-Packard's 3000 series.

The 2200VS ranges in price from £40,000 to £300,000 in the UK.

IBM PoS system offers new-style receipts at Tesco

RECEIPTS like the one pictured right, with product descriptions as well as prices, are now being presented to customers at Tesco's Wellingborough, Northants, supermarket when their shopping is checked out using the IBM 3680 point-of-sale system.

The IBM system at Wellingborough is the first PoS system to be installed at a Tesco supermarket and will be used to evaluate the technique and to determine customer and staff reaction. The EPOS, Electronic Point of Sale, project, as it is called, will last two-and-a-half years, after which long-term decisions will be taken on the wider use of PoS, according to Tesco.

Tesco plans to evaluate laser scanning of bar-coded product numbers pre-printed on grocery items, but at the moment it is labelling each of 5,000 items at the Wellingborough store with a unique eye-readable product number.

The number is keyed in at the check-out by the cashier and relayed to the back office minicomputer which looks up the price and product description from a file on disc. This information is then transmitted to the check-out and printed on the receipt.

When the IBM 3032 and 3031 mainframes cur-

QUICK-JEL	.04%
PKT CAKE MIX	.26%
SUGAR STRNS	.17
TOTAL	3.39
CSH TEND	3.50
CHG DUE	.11

17/06/78 10:37 3368/ 3
+CHECK OUT TESCO PRICES*

nently being installed by Tesco at its Cheshunt, Herts, headquarters are fully operational the disc file at Wellingborough will be updated via a Post Office link to Cheshunt.

The IBM mainframes are replacing existing equipment at Cheshunt that includes three ICL 1804S machines (CW, November 17, 1977).

Get the VAX facts: Get mainframe FORTRAN performance without waiting in a batch queue — or paying batch-prices. If you have an application in aerospace computation, signal processing, simulation, educational computing, industrial automation, or any other big FORTRAN job, get the VAX facts today. Write for your copy of the VAX-11/780 brochure and complete technical summary.

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And wins two rounds out of three.

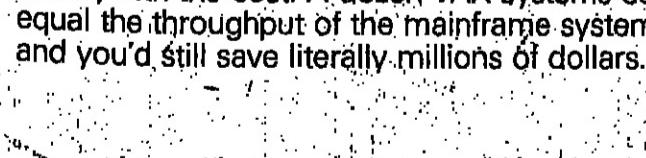
Round one to the 60 bit mainframe:

Speed. The mainframe is still the speed champion with 9100 Whetstones per second.

MAINFRAME	VAX-11/780
9100 WHETSTONES/SEC	711 WHETSTONES/SEC
MAINFRAME	VAX-11/780

Round two to VAX: Price/Performance.

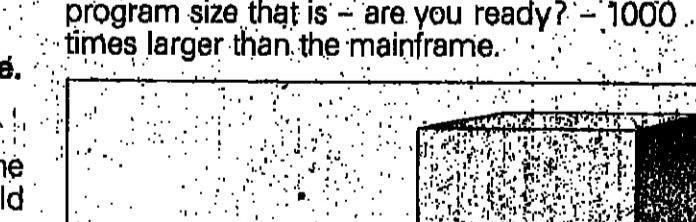
The 32 bit VAX is the world's fastest mini. A VAX system runs 711 double precision Whetstones. That's one twelfth the speed — at one twenty-fifth the cost. A dozen VAX systems could equal the throughput of the mainframe system — and you'd still save literally millions of dollars.



9100 vs ITAF

Round three to VAX: Program size.

Virtual addressing and a gigantic 32 bit address size, compared to the 18 bit address size of the mainframe, allows VAX a directly addressable program size that is — are you ready? — 1000 times larger than the mainframe.



Directly addressable program space: mainframe
Directly addressable program space: VAX-11/780

digital

Digital Equipment Co. Limited



Victorious in the T shirts worn by the company's men and women competitors and a large fan club who boosted their efforts, are winning men's team from Peterborough Data Processing: standing left to right are systems engineers Jeff Bennett, John Leigh, Paul Butler and Keith Wilson with Male Superstar of the Midlands, Dave Beardell kneeling.

Triumph for Peterborough and Scicon

THE grey summer broke into a cheery sunny smile in Birmingham on Sunday, July 9, to provide an ideal setting for the final regional heat of the DP sports event of the year, Computastars.

Held at the New Alexander Stadium, Perry Barr, which was officially opened last month, the Midlands heat turned into a triumph for the teams from Peterborough Data Processing and Scicon Computer Services, although there were some close results.

In the ladies' individual event, there was only $\frac{1}{2}$ point separating the two leading contestants with one event to go.

But programmer Jean Eys from Scicon won the most testing race in the competition; the steeplechase, to take the Midlands Wonder Woman title with 32 points, followed by the gallant J. Heath from Peterborough DP with 27½ points.

Jean, together with her Scicon team mates, tape librarian Jennifer Harvey and client adviser Linda Ackers, won the ladies' team event with 92 points, with the Peterborough ladies runners-up with 78 points and British Industrial Plastics third with 66½ points. All three teams will be invited to the Crystal Palace Final on September 9.

The Peterborough men went one up on the girls by winning both the team and individual events. Systems engineers Jeff Bennett, John Leigh, Paul Butler and Keith Wilson worked hard and well in support of their number one man, Dave Beardell, to take the men's team title with 157½ points, closely followed by the team from ICCC in Birmingham with 151 points.

The men's teams to go through to Crystal Palace from the Midlands will also include the third and fourth teams, Scicon I and ICL Scientific Languages, Kidsgrove, together with the winners of the Plate competition, the DP men from chemical manufacturers Diversy of Northampton.

Dave Beardell took the individual title, although he was well beaten in the dreaded final steeplechase event by a dramatic late sprint from John Britton of ICL. In the overall event, however, John was two points behind Dave, who topped the table with 34½ points.

After the long, enjoyable, but, for the competitors, tiring day, those who failed to reach the finals contented themselves with some refreshing drinks and talk of "wait until next year". While those who had won their way to the culmination of the 1978 Computastars said goodbye with an adieu that went something like "See you at the Palace".

A novel way of taking the "killer" water jump in the steeplechase...



Windsorwest visitors of the ladies' events are (left to right) programme manager, Linda Ackers, who works for Scicon Computer Services in Milton Keynes, and client adviser, Linda Ackers, who works for Scicon Computer Services in Milton Keynes. On the individual title, Jean Eys, winner of the ladies' team event, left, and Linda Ackers, who works for Scicon Computer Services in Milton Keynes, right.

Scicon

PEOPLE

Financial controller at Data General

APPOINTED controller of European operations with Data General is John Gardner, who was previously financial director of Rolls Royce, and before that, European controller for General Foods.

Gardner will be located at Data General's Paris HQ, and will be responsible for financial control of sales and service operations in the UK, France, Switzerland, West Germany, Austria, Belgium, the Netherlands, Sweden, Denmark, Italy and Greece.

AT F International's still unnamed managing director Sue Alaway (above) received a birthday present of a bouquet. Other presents made were to founder Steve Shirley — a specially signed ring in the shape of an International pin — gold bars for long service to five members of staff: Sue Alaway, Diana Hales, Sue Prince, Elaine Taylor and Tomlinson, and a retirement gift to accountant Geoffrey Symon.

Come to the Grand Final

All is now set for the Computastars Grand Final to be held at Crystal Palace in London on September 30.

Full details of the day's plans will be published shortly. Judging by the regional heats that have taken place throughout the summer, the day will prove to be an enjoyable family outing as well as a test of the skill, speed and stamina of the competitors.

Computastars has been organised by John Goldsmith's Computer Services, with Gordon Cairns doing a magnificent job not only in the preparations be-



fore the events but in handling the complex and difficult organisation of the day's events.

Any one who is willing to help Gordon in the refereeing and marshalling at Crystal Palace can contact him on 01-828 6356 at 18 Buckingham Palace Road, London SW1 OPF.

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The continuous business forms manufacturers' section of the British Printing Industries' Federation was set up in 1968 with the aims of increasing efficiency and profitability within the industry. Its membership includes most of the main computer stationery manufacturers, and the current chairman is Cliff Brown, managing director of Roffs Print who, in this article emphasises that the opinions expressed are his own. But they offer an interesting look at the current state of the industry.

'Carbonless' means greater security

A SUPERFICIAL appraisal by the computer department will naturally conclude in favour of one time carbon as against carbonless paper on grounds of cost, for Idem computer forms can cost up to 30 per cent more. Raw material costs alone however, give a distorted picture, and a more meaningful appraisal would be made under the heading of "Total Systems Costs," taking into account

various savings within the stationery system as a whole, made possible by the use of carbonless paper.

The Idem Division's marketing team has been putting over the total systems costs story at seminars held for computer people for some time, and the story can be simply summarised. Take the performance of Idem on computer output printers.

Because there are no carbon interleaves, more copies are obtainable. You will get up to eight parts on an IBM 1403, and to get the same number using carbon would require a grade of carbon paper far too expensive to use on computer, such as one of the plastic backed film carbons.

It is in this sort of comparison that the systems costs argument shows an economic advantage

for Idem. It is true that you may not need eight copies, but if you do you will need two runs with one time carbon as against one with Idem.

Another hidden expense of carbon stems from its innate "dirtiness" and tendency to smudge. After all, it is accepted that the economics of computers are largely based on savings on manpower and simplification of office systems.

These advantages can easily be eroded if faulty, smudged or unreadable copies creep into the system, creating the need for further print runs or photocopying of originals, plus the inevitable telephone and postal costs incurred in replacing bad copies.

Needless to say, this problem does not arise with Idem. With carbonless paper the copy image is within the paper rather than on its surface. It is therefore completely smudge-proof. Nor does it suffer from lost information due to carbon sheets that break loose from crimping — "carbon wander."

Furthermore, with no carbon to shred or otherwise dispose of, the computer department is saved one more time consuming and expensive operation.

Unshredded carbon, the extra copy, is a security risk. For example, I was once passing a building occupied by a well known credit rating firm and outside the entrance a sheet of carbon lay near a dustbin. It contained a readable copy of an intimate credit analysis of a large company. When I telephoned the company's managing director, he was predictably horrified to learn that his company's private financial affairs were lying on the pavement of a busy London street.

Of course carbon disposal can, in a large installation, be quite a headache. Someone is required to move bins of waste carbon at fairly frequent intervals, for 10,000 five-part sets, eight inches deep, contain nearly 9,000 yards or just over five miles of carbon.

These then are very briefly the sort of hidden savings apparent from total systems costs analysis, but that in itself is not the whole story.

The nature of the carbonless product creates opportunity for the computer operator to streamline his system, and simplicity brings its own savings.

Where a multi-part form calls for information to be screened out of certain parts of a set (a good example would be a combined invoice and delivery note set where costs and discounts may not be required to be shown on the delivery note) Idem can be very simply de-sensitised in areas where a copy is not wanted.

True, forms designed for use with OTC can have sections blocked out or covered with scramble pattern, but this renders that part of the working surface unusable — thus calling for more expenditure on larger forms to carry the same amount of information.

Where confidential information is being transmitted on, for example pay advices, invoices and statements, Idem makes possible the simple and economic hidden entry system processing a sealed carbonless envelope through an output printer in one operation.

With the use of Idem Monoform or Action self-imaging papers, it also makes possible a host of carbonless entry operations on both output printers and also on input printers like credit card sets.



By Keith Flack

The headache of carbon disposal and the security risk of unshredded carbon are only two of the problems avoided with carbonless forms, says Keith Flack, marketing adviser with Wiggins Teape Idem division. "Total Systems Coating" can also reveal various savings within the stationery system as a whole.

approximately 72 sets per 10,000 set run using OTC.

Nor should one forget the complex area of computer ancillaries: decollators, bursters, guillotines, folding and inserting machines.

On all of these, carbonless

products at least as well as other

papers, while on decollator it

has the considerable benefit of less loading time.

These then are very briefly the

sort of hidden savings apparent

from total systems costs analysis, but that in itself is not the whole story.

The nature of the carbonless

product creates opportunity

for the computer operator to

streamline his system, and sim-

plicity brings its own savings.

Two identical-size standard

boxes will take 200 to 250

part carbon sets and 350 six-part

Idem sets. For the computer

operator, it can easily be demon-

strated that this factor

alone brings about operational

cost savings.

Longer pack mean fewer

stops for reloading. This may not

appear significant until you

consider the following

comparison based on a mean average running time cost of £1 per minute.

With OTC, packs containing

250 sets would require 40 stops

in the course of a 10,000 set run.

Idem packs, at 350 sets per pack,

would require only 28. One re-

load would involve an average

of 2.5 minutes, at a cost of £2.50.

An additional 12 stops needed

for OTC would cost £30 per

10,000 form run, a formidable

on-cost for a high volume de-

partment.

Following on from that it

should be remembered that

every time stationery is loaded

on the computer printer there is

a wastage of several sets of

forms — both the tail end of the

old pack and the feed-in of the

new pack. Over a few months,

this wastage is significant —

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Pussycat. People who make 30 cps printers will think it's an incredibly funny name. Until they realise our meek little Model 650 is much lower in cost than their machines, three times faster, and a lot quieter and easier to maintain.

In quantity 25 the Model 650 costs less than £700 each. Which means you can buy a VDU and a Pussycat printer for what you may be paying for a printing terminal alone.

The Model 650 is fast. It prints an entire screen full of characters in 20 seconds. And, because it's the only printer in its class with a full screen buffer, the Model 650 can free the VDU in 2 seconds or less. So the operator can go back to work while the printer is printing.

The Model 650 connects to any VDU terminal with an RS232 port - a Perkin-Elmer terminal or, perish the thought, someone else's. No need to replace existing hardware or software.

And no need to worry about noise or maintenance. The Model 650 has only one moving part - the platen.

Checkout The Pussycat from Perkin-Elmer. It's a great little printer at a very reasonable price.

And, if you're one of our competitors . . . Smile, when you say pussycat!

For more information write to, or phone, Tony Bewick at Perkin-Elmer Data Systems, Terminals Division, 227 Bath Road, Slough SL1 4AX (Tel: Slough 34511)

Distributor enquiries welcomed.

PERKIN ELMER
Data Systems

Vital part in payroll service

COMPUTER stationery is playing a vital role in the development of one of Europe's most successful computer payroll services. The stationery, designed and produced by PFC (Continuous Forms), of Cradley Heath, West Midlands, plays an

integral part in Payfact, a pay-roll system which has become an overnight success for European bureau, CMG Computer Management Group (UK).

Payfact attracted 100 subscribers in the first week of its operation following the launch

User must get to know his forms manufacturer

NO feature dealing with computer supplies would be complete without a reference to computer stationery, that important commodity which so many DP managers take for granted until it fails to be delivered on time or does not match up to the expected quality.

The situation became more complicated in the early 70s. The forms industry twice found itself stretched to capacity through extra demands placed upon it, first with the change to decimalisation and later the introduction of VAT.

At the same time, there was a downturn in the general printing industry and some jobbing printers who had no previous experience turned to what they thought was an expanding market — in fact the printing industry in general is notorious for buying equipment without first thoroughly examining the market.

It is unfortunate that some purchasing officers, particularly those with little knowledge of print buying, assume the attitude "what's so special about continuous stationery — it's only paper with holes down the side." As anyone who has had experience of buying knows, there is a lot more to it than that, including a wide variation in the standard of product and service from computer stationery suppliers. This is hardly surprising as the business forms industry of today has an annual value approaching £90 million.

Nevertheless, throughout this

difficult time, some companies

have come through unscathed,

refusing to lower their standards

and continuing to invest in new

equipment. In fact, the business forms industry is still one of the best equipped sectors of printing with a very high level of investment in new machinery.

In the opinion of Brown, what

will emerge — and the signs are

already there — is a slimmer

industry made up of the original

forms companies that are left

and those later entrants who

have specialised.

Today, specialisation

whether it be in the size of run or a particular product.

What does all this mean to the user of computer stationery?

First of all, that has to get to

know his forms manufacturer.

Choosing a stationery supplier is almost as important as choosing the hardware and it is worthwhile getting to know the forms salesman; whether he be from a manufacturer or an independent forms distributor.

All too frequently, this most

valuable and inexpensive source

of advice is ignored or called in

too late. A producer's advice will

be sound and practical: it will

frequently lead to improved de-

sign and faster delivery and it

could save a lot of money.

If called in at an early enough

stage, a forms producer will

ensure that the buyer does not

receive a specification which

causes needless expense.

It is often easier and cheaper to design the whole form right from the initial O&M stage than to try to produce output in a format which has been drawn up with no understanding of printing methods and techniques.

During the 50s and 60s, most

computer stationery

was made

by this small band of suppliers

who invested heavily in

equipment

for products such as continuous envelopes and other mailing products, computer letters, check digit numbering on input docu-

ments, etc. Some stationery may appear to be more expensive than that being used previously, but in the long run could save money if the user department can simplify clerical procedures and improve efficiency.

Modern printing presses run at high speeds but have a long make-ready. The term "make-ready" or "set-up times" is the time required to prepare the press for printing, usually a minimum of three hours, yet a run of 40,000 forms may only take an hour to roll off the machine. There is, therefore, an optimum point, which will depend on the individual form and press being used, between run length (and capital tied up in stocks) and unit cost.

It is for a similar reason that machine proofs are expensive — the press either has to be left idle awaiting approval of the design or the set-up has to be repeated.

As a rule, the more complicated the form, the more worthwhile it is to consider larger quantities.

No forms producer can afford to keep stocks of all the different paper sizes, weights and tints.

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difference in price and the more

exotic the shade the more expen-

sive the stocks.

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Services industry 17% growth

Sales of computer services in the US grew by 17% last year, with total turnover reaching \$6,900 million. This is revealed in ADAPSO's annual report on the services industry, compiled by Input, the market research firm.

Of the three segments of the industry given, bureaux earned \$5,200 million, software houses \$810 million, and consultancies \$872 million. Banking and manufacturing were the industry's major customers, banking providing 17% of total revenues and manufacturing 21%.

The study also looked at the impact of minis and microcomputers on the services industry. It concluded that about 25% of existing services business, largely at bureaux, is vulnerable to replacement by in-house minis. However, the larger bureaux expect to gain business by installing minis and micros at their customers' premises. About 7,000 such installations are expected by 1979.

The report is available for sale by ADAPSO at \$495 a copy.



A young visitor has her fortune told by an MDS Series 21 Model 40 system at Relgate's Old English Fayre last week. The Series 21, operated by "Gipsy" Pat Gill of MDS, was installed in the sideshow run on behalf of Action Research for the Crippled Child. The Fayre was organised by Relgate Round Table.

GEC pre-tax profits up 16%

PRE-TAX profits at GEC rose 16% to £325 million in the year to March 1978, with turnover up 14% at £2,343 million. The company did £608 million of business overseas, representing 26% of the total. The largest single sector is the one that groups

together electronics, automation and telecommunications, which produced turnover of £672 million in the UK. GEC now has £16.7 million in net cash, but as this is in the UK it would probably have to arrange a loan for acquisitions in the US.

For further information contact James Robinson at the Institute of Export, World Trade Centre, London E1. Tel: 01-488 4766.

Analysis of European electronics manufacturers

FINANCIAL details of the 50 biggest electronics manufacturers operating in Europe are provided in a yearbook now available from Mackintosh Publications Ltd. The companies listed sell all kinds of electronic equipment, including computer systems, text processers and electronic calculators and cash registers. The other product areas include communications equipment, consumer electronics and components.

For each company the year-book lists its sales by product, by area and by subsidiary companies, where they exist. Profit and asset figures are also provided and in most cases figures are presented for each year going back for up to 10 years. In each case the latest figures relate to 1976.

The biggest electronic supplier in Europe in 1976 was IBM, with sales worth more than \$7,400 million, while Phillips followed fairly closely with \$6,500 million, although computer equipment accounted for only a small percentage of this.

Of the total sales of electronic equipment in Europe in 1976 of \$50,000 million, US based firms accounted for \$16,000 million. West German based companies, for more than \$9,000 million, and UK and French firms for about \$5,000 million each.

Mackintosh Yearbook of European Electronics Companies 1978, £16, 100pp, Mackintosh Publications Ltd, Mackintosh House, Napier Road, Luton, England, LU1 1RC. Tel Luton (0582) 417438.

NEWS IN BRIEF

Little to fear police chief

THE public have little to fear from the use of computers by British police, according to Sir David McNee, Commissioner of the Metropolitan Police. But, he told a CSA lunch, clear and adequate safeguards are needed against the misuse of computerised information.

However, if general access were allowed to police records would greatly inhibit police work, he said, adding that he thought most people "are not very concerned" about being able to inspect records.

Anti-trust limits

A US government commission studying ways in which anti-trust cases such as the nine-year-old case against IBM can be speeded up, has been advised to recommend that strict limits be set on the pre-trial period for assembly of evidence, with penalties for lawyers who use dilatory tactics or file irrelevant motions.

Zilog launch

A MICROCOMPUTER model that can be used as either an intelligent terminal or as a general computer system has been introduced by Zilog.

Known as the MCZ 1/80, it is based on a dual Z80 microprocessor board configuration.

Certificate record

A RECORD number of students at the University of Warwick, United Kingdom (N44/00F), Tel: (01923) 75-1422, have gained the National Computing Centre's Basic Computer Systems Award this year. Of these, 100 certificates were overseas.

ECC directive

COMPUTERS are free from EC trade directives until 1981. A recent report by a printer's group added new year-on-to-the-later deadline.

'Up to 20,000 Series 1 minis a year by 1981'

BY 1981, IBM's Series 1 minicomputer is predicted to bring the company annual business of \$16 million, and to represent one-fifth of the total business then done by the General Systems Division, GSD, contained in a report on the Series 1 from International Data Corp., IDC.

IDC also predicts that IBM will be shipping over 10,000 Series 1 minis a year by 1980, and will be up to 20,000 a year by 1981, and contrasts this with minicomputer market leader Digital Equipment Corp.

According to IDC, DEC shipped 19,500 minis in 1976, after it had been in the business 11 years.

It also forecasts that IBM's share of the world minicomputer market will grow from 3% last year to 15% by 1981, but adds a word of cheer for the traditional minicomputer makers: only 20% of the business will be at the expense of other manufacturers; the remainder will be from new markets developed by IBM.

This is a repeat of last year's "Export Year Export" competition, which was sponsored by the Institute of Export, the TUC and the CBI.

Men and women working in or studying for the export business will be asked a wide range of questions on matters relating to exporting, and the winner will receive a prize of £500.

Each winner of the five regional heats of the competition will receive £100 and go on to the national final. Last year's winner, Brian Moran of Rexel, will defend his title.

Those interested in competing should contact James Robinson at the Institute of Export, World Trade Centre, London E1. Tel: 01-488 4766.

Search is on for the UK's 'export expert'

A COMPETITION to find Britain's "Export Expert" is to be held by the Institute of Export, in conjunction with, among other organisations, the CBI and the TUC.

Men and women working in or studying for the export business will be asked a wide range of questions on matters relating to exporting, and the winner will receive a prize of £500.

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MICRO NEWS

'Bleak future' for micro applications

AT the same time that two of the three working parties set up by the Advisory Council for Applied Research and Development to look into the impact of the microprocessor on British industry, have completed their reports, a chilling indictment of the industry's capability to use the device has come from Sussex University's Science Policy Research Unit.

In a report called "The Impact of microelectronics in the UK: A suggested classification and illustrative case studies," the SPRU points to a potentially bleak future.

The Sussex report refers to what it calls a "dynamic failure mode" in those areas of British industry that are already under threat of foreign imports that either use micros, or employ them in the manufacturing process. The dynamic failure mode is one in which only the successful companies can afford the high costs involved in developing new products and production processes. The less successful companies are left to become progressively less successful.

The report also highlights the underlying theme behind the Department of Industry's efforts to generate a strong UK microelectronics industry, and the National Economic Development Office's insistence that support for it should cover potential standard products, as well as specials.

The DoI suggested that only 50% of UK industry knew about micros, and only 2% of that figure were actually doing anything about it. The report is certain to call for support along the lines set out by the DoI, but

probably at greatly increased levels.

The importance of the second report is of greater potential, for the expertise to develop microprocessor applications economically is probably available in the UK, if the right circumstances can be established to promote and exploit it.

These two reports will now be studied by the full Council and government ministers, together with the third working party of the ACARD trio. This has the task of examining the long term social and economic implications of the growth of microelectronics exploitation..

It seems certain that it will take the view that UK industry must take the opportunities presented by the micro, from the threat to industry from more advanced competitors will be there anyway.



The recent computer Othello competition which was sponsored by consultants Zeta Hermes and Computer Weekly brought out a variety of systems, and our picture shows Zeta Hermes managing director, Mick Punter, playing one of a amateur.

This is the version being sold by Mine of Information of St Albans to run on the Nascom 1 microcomputer kit. Available in cassette form, with documentation, for an all-inclusive price of £2, the package provides a full 8 by 8 matrix display. White pieces are represented by an open square, while black pieces are shown as hatched squares. A comma indicates an empty square into which it is possible to move.

The program automatically detects the end of the game, but leaves the two players to count their own pieces to see who has won.

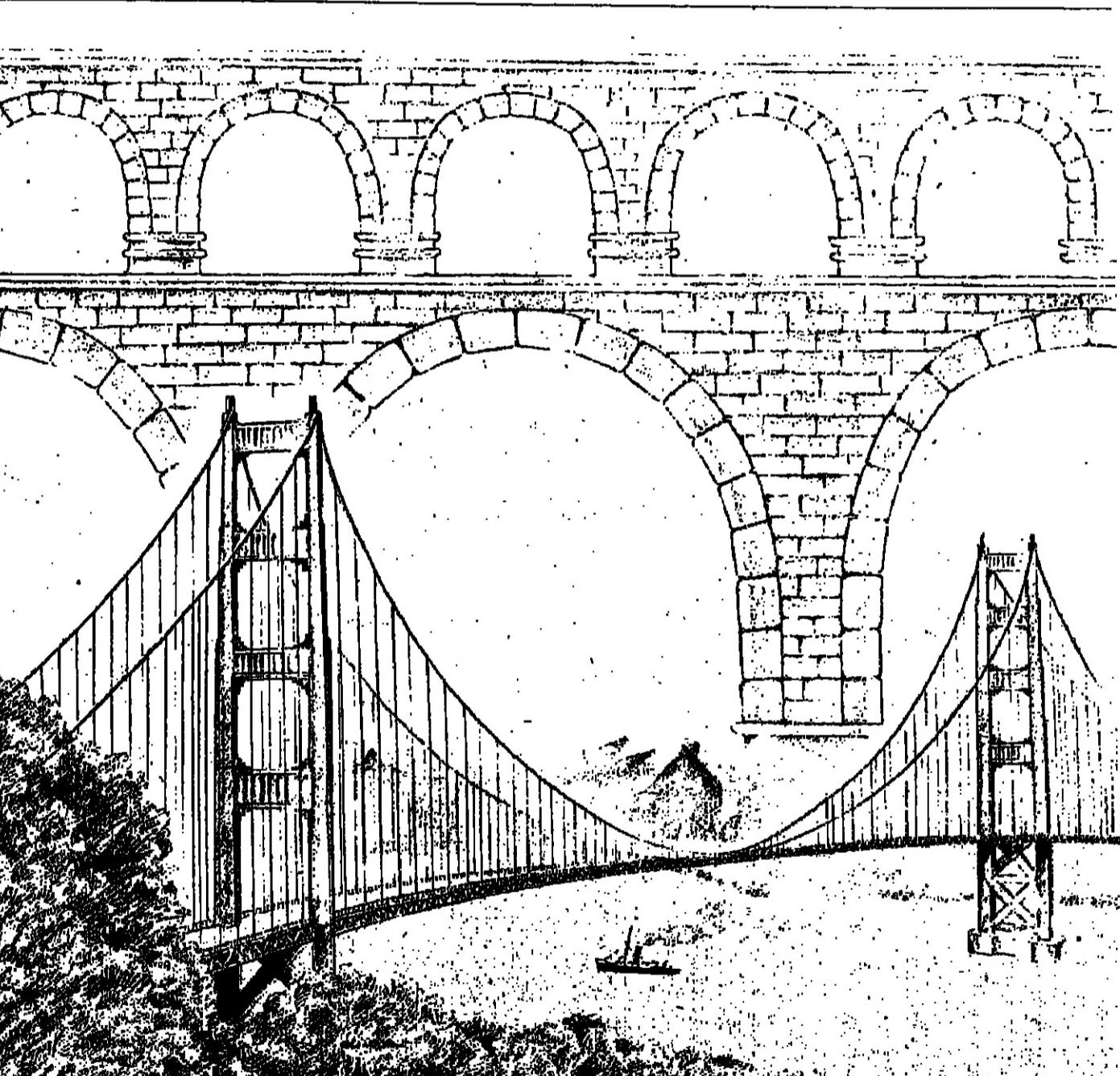
Service company for kits

THE growth in the number of microcomputer kits has prompted the formation of a new company, Video Terminals, that intends to service the market's need for power supplies and video monitors.

Based at 197 Hornbeams, Harlow, Essex, the company's first product is a combined power supply and video monitor that will be available in either kit form, or pre-assembled. Although aimed initially at the large number of Nascom 1 users, the kit will operate with most systems currently available.

Two versions of the system will be produced, each of which will have a nine-inch display tube. One supplies 1.2 amps at 5 volts, the other 4 amps at 5 volts.

In kit form, the former will cost £168 and £185 pre-assembled, while the latter will be priced at £178 in kit form, and £193 pre-assembled.



Bywood gives details of Scrumpi 4 kit

MORE details have come from Bywood concerning its soon to be announced Scrumpi 4 microcomputer kit, first mentioned publicly by the company at the Do It Yourself Computer Show.

As indicated, the system should be one of the first kits available that makes use of a large capacity ROM to hold the Basic Interpreter software. This is a 32K bit device from National Semiconductor that is masked with the company's NIBL, National Industrial Basic Language. This is a 4K byte tiny Basic that requires a minimum of 1K byte of addressable memory for operation.

Additional sockets for further ROMs are also included. In particular, there is a socket for the new National Semiconductor 64K bit ROM announced earlier this year and due to be available before the year is out.

Like the other Scrumpi kits, number 4 is based on the National Semiconductor SC/MP 2.

microprocessor, and in minimum configuration will be equipped with the 1K byte of RAM required by the software.

It will, however, be socketed to accommodate up to 14 devices of the 2114 type, giving a total capacity of 8K bytes of RAM, plus an additional eight sockets for either 2708/2716 type ROM/PROM devices, or RAMs with similar pin out configurations, which takes the total RAM capacity up to 16K bytes.

Additional sockets for further ROMs are also included. In particular, there is a socket for the new National Semiconductor 64K bit ROM announced earlier this year and due to be available before the year is out.

Like the other Scrumpi kits,

number 4 is based on the National Semiconductor SC/MP 2.

1800% growth at Crellon

THE expansion of the market for applications of the microprocessor is such that Crellon Microsystems, a division of component distributor Crellon Electronics, expects its second year turnover to grow by a colossal 1800% over the £55,000 achieved in its first year of operation, but its turnover predictions for the following year are more modest at 50 to 100%.

According to David Jackson, the division's technical manager, this growth rate is based largely on the decision by the distributor company to establish what he called a "proper support program for industrial companies that lacked the technical and expertise to apply microprocessors to their products."

Although currently geared to work with the devices its parent company sells, and with some £60,000 worth of suitable development systems already installed, the division is now planning to expand its operations beyond

these franchised products. It is currently looking at both the Tektronix and Futuredata development systems.

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Design this year.

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HOLLAND	£400 p.w.	£230 p.m.
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BELGIUM	£ NEG + EXPENSES	£220 p.m.
GERMANY	£ EXCELLENT	£220 p.m.

Phone now for immediate and future contracts.
Ring Christine Kay/David Hayton, 734 0152 (24 hrs.)

KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON W1. TELEPHONE 01-734 0152/6 (24 HOURS)
OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

★ SALARY

PROJECT LEADERS

CITY An outstanding opportunity exists within international finance group for 2 project leaders with experience at that level on ANY hardware, preferably in financial or insurance areas. Ideal candidate will have dynamic personality, confidence and self-motivation, be able to liaise at all levels and responsibility to act on own decisions.

- * Security in a growing organisation
- * Mortgage assistance/STLS/Non-contributory pension
- * 5 weeks' holidays/sub restaurant
- * OPPORTUNITY TO TRAVEL ABROAD

REF. 1848

JUNIOR PROGRAMMERS

LONDON Multi-national company retaining large IBM 370 hardware requires programmers with at least 12 MONTHS' ASSEMBLER experience to join highly professional team. They are currently developing a major sophisticated on-line system.

- * Highly progressive organisation
- * Continued development with a well-planned schedule
- * Good promotional prospects
- * Excellent benefits including cheap travel

REF. 1290

MINI PROGRAMMERS

HOLLAND

Our client, a major and successful concern, wishes to strengthen its European programming team. Retaining IBM 370 hardware under DOS/VSE, company seeks ambitious person with at least 18 months PL/I experience with knowledge of COBOL an asset.

- * Involvement in the development of new projects
- * Opportunity to work in an expanding organisation operating world-wide
- * Based approximately 25 miles south of Amsterdam
- * Salary DFL 40,000 (£10,000) + cost of living and relocation expenses

REF. 1836

ICL PROGRAMMERS

LONDON

Due to development of their advanced computer systems, successful D.P. Services dept. seeks to boost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with minimum 2 years' ICL COBOL & PLAN experience.

- * Training on IDMS Database
- * Development to analysis
- * Opportunities to join senior level
- * Applications in various areas providing an exciting and interesting career
- * Excellent perks include flexible working hours and 4 weeks' HOLIDAYS
- * Salary c£5,800

REF. 1549

ESSEX

International company engaged in manufacturing, distribution and sales of well-known commercial products, seeks person with design processing, warehousing and sales forecasting systems in an IBM environment. He or she should have the potential to control Project team developing one or more of the above systems.

- * Excellent working environment
- * Paid overtime
- * Flexible hours, 4 weeks' holidays
- * Company expansion with additional hardware
- * Salary c£8,500+

REF. 1627

W. LONDON AREA

As part of a prestige, international group of companies, our client is now recruiting for programmers with minimum 2 years' PL/I experience with Assembler an asset for the development of manufacturing systems on the IBM series I mini computer.

* Excellent opportunity to be trained on Mac computer

* Versatility of IBM series I — in relation to manufacturing

* Working with up-to-date technology

* Excellent career opportunities including chance of working with micro-computer

REF. 1591

DATA RECALL LTD.

Sondes Place, Dorking, Surrey

DATA RECALL LTD.

Science Research Council
ROYAL GREENWICH OBSERVATORY
COMPUTER DEPT.
For vacancies for
PROGRAMMERS
Higher Scientific
Officer/
Scientific Officer

There are two vacancies for programmers in the Computer Department of the Royal Greenwich Observatory at Herstmonceux. The Department is responsible for the provision of central computing services of the Observatory. An ICL 1903T computer system is used for batch and interactive data processing, and an Interdata 70 mini computer for interactive graphics. A remote job entry terminal provides access to a powerful dual IBM 360/195 system at the Science Research Council's Rutherford Laboratory, near Oxford. The staff of the Department are responsible for development of applications programs as well as for the improvement of the systems software and user support.

Post 1 is for a Higher Scientific Officer to join a small group that is developing new methods for the interactive analysis of astronomical data in digital form, which will be produced by new instrumentation on large telescopes. It is expected that new facilities, including colour TV displays and possibly an array processor will be obtained in order to allow more sophisticated, and faster, processing. Applicants should have a good honours degree in physics, mathematics or other relevant subject, and at least two years' post graduate study or experience of scientific data analysis using computers. Salary, starting between £4,101 and £4,679 according to experience, rising to £5,440.

Post 2 is for a Scientific Officer to work mainly in the programming group for the main computers on both systems and applications software, in collaboration with scientists and engineers of other departments. Current projects concern the provision of more powerful graphic output facilities, and the implementation of word-processing and information-retrieval systems. Applicants must have a degree, or equivalent qualifications, in computer science or a related subject, and an interest in scientific applications of computers. Experience of Fortran and ICL 1903T computers would be an advantage, but further training will be given as necessary. Salary scale £2,839-£4,115. Starting salary according to qualifications and experience.

Both posts are permanent and pensionable (non-contributory pension scheme).

Application forms and further information can be obtained from Mr. John Philcox, Royal Greenwich Observatory, Herstmonceux Castle, Hailsham, East Sussex BN27 1RP, telephone Herstmonceux (032-181) 3171 Extension 208 and should be returned not later than 11th August 1978.

NALGO Requires:
DEVELOPMENT OFFICER
Salary £5,797-£6,361 p.a. (under review). Applicants should have two years' in-depth system analysis experience and ability to communicate effectively with user departments. Must be self motivated.

2 PROGRAMMERS
Salary £4,780-£5,050 p.a. (under review). Applicants should have two years' Cobol experience on ICL 1900/2903.

To work on ICL 2904 (40K), Tapes, EDS 60's, and D.D.E.'s.

Applications include financial, insurance and assurance, building society, salaries, wages, etc. Minimum of 28 and 23 days annual leave respectively for these posts and additional leave at public holidays. Partial mortgage interest rebate, Contributory pension scheme, Staff restaurant, Salary Increases, operative from 1st July, 1978 are currently being negotiated.

Requests for application forms and further information should be sent to:

The General Secretary, National and Local Government Officers' Association, 1 Mabledon Place, London WC1H 8AJ.

Closing date: 4th August, 1978.

SOUTH-WEST UNIVERSITIES REGIONAL COMPUTER CENTRE - UNIVERSITY OF BATH
ICL 2980 OPERATING

The Regional Centre operates a large 2980 system under VME/B, providing computer services to Universities in the South-West via powerful communication packages.

Applications are invited for the post of

SENIOR OPERATOR

This post offers excellent OPPORTUNITIES for CAREER ADVANCEMENT with ICL, new referee. Candidates should possess initiative, technical ability, plus an enthusiasm for operating.

Salary £6,281-£7,344. Job Share Allowance of £371 (under review).

Application forms and further particulars, quoting ref. 78/401, from Personnel Officer, University of Bath, Claverton Down, Bath BA2 7AY, closing date: 20th July 1978.

Ref. 78/401

DP Specialists...

Take a really hard look at our software

Our Electro-Optical Systems activities at Basildon have established us as one of the foremost authorities on the design, development and manufacture of advanced systems for a wide range of commercial and military applications. We produce specialised television and other viewing devices and make use of digital and RF techniques and highly sophisticated signal processing and transmission systems.

The applications for our equipment are many and varied covering ground-based, airborne, shipborne and underwater surveillance, guidance and tracking systems including those for the latest Sting Ray torpedo project. At the heart of many of these systems is a mini-computer or microprocessor and it is in this highly specialised area of data processing that we are looking for additional men and women to fill the following appointments:

Team Leader

This position in the Future Systems Laboratory is for a senior DP specialist to lead a team working on signal processing techniques. It calls for a degree in mathematics, physics or electronics engineering plus several years' experience of digital and analogue correlation techniques and some knowledge of statistical decision making. Experience of recursive filtering, fast Fourier transforms and state variable techniques are also desirable.

Computer Application Engineers

To work on trials analysis. Essential requirements are a degree in physics, electronics or computing science; experience in the use of computers in an overall system and software design. It would also be an advantage to have experience in analogue and digital circuit design, software design for mini-computers or microprocessors and underwater signal processing.

Programmers & Electronic Designers

To work on conditioning chamber control and automatic test equipment using a PDP 11 computer. Other work will cover project control, line of balance and other related activities. Essential requirements are qualifications to at least HNC level with experience of FORTRAN/Assembler languages and mini-computer and microprocessor work. Experience in business administration would also be useful.

Computer Operator/Programmer

To operate a visual display unit for printed circuit board design and other tasks. It will involve maintaining close liaison with engineers to obtain data for the running of programs; assisting on program coding and maintaining records. A good technical background is essential together with experience in the use of computers.

Our work offers a stimulating and challenging opportunity to those with the ability to involve themselves wholeheartedly with our projects, and future career progress can be rapid if you have the necessary skills and potential to take responsibility.

Salaries are highly competitive and the benefits generous, including assistance with relocation where appropriate.

Write with details of your experience stating the position of interest to J. S. Nealon at Marconi Avionics Limited, Christopher Martin Road, Basildon, Essex. Telephone: Basildon (0268) 22822 ext. 80.

MARCONI AVIONICS
A GEC-Marconi Electronics Company



SPEND 12-18 MONTHS IN THE USA
RETURN TO A CAREER POSITION IN THE UK

ANALYSTS & PROGRAMMERS

All 3rd generation hardware backgrounds considered. Openings at all levels.

OPPORTUNITY TO GAIN 370 TRAINING AND EXPERIENCE ON AN EXCITING 1-2 YEAR VISIT TO AMERICA

Join INFORMATICS INC., a prestigious world-wide consulting company. Initial assignments will be in the US as part of our program of Orientation, Training and return to our British operation. We have recently opened a London office and have plans to expand throughout the UK, thus affording you an excellent career.

The successful applicant will have a minimum of two years' programming experience, using RPG II, and will probably have worked in a manufacturing environment.

Commencing salary will be dependent upon age and experience, and the company offers a wide range of benefits, including 28 days' annual holiday, and contributory pension scheme with free life assurance benefit.

Please write or telephone for an application form to Mrs. P. Cowgill at the address below.

LONDON: JULY 27th

To arrange a confidential interview send resume immediately, or phone our UK representative, L. Levine, beginning Monday, July 24th (reverse charged accepted).

Levine, Royal Lancaster Hotel, Lancaster Terrace, London W2

Tel: 01-482 6737

COMPUTER PROGRAMMER

Bostrom Division of UOP Limited is the world's leading manufacturer of suspension seating for the truck, tractor and industrial equipment markets.

We are currently seeking an experienced programmer to join our small, but expanding D.P. installation, which utilises an IBM System 3 Model 12.

The successful applicant will have a minimum of two years' programming experience, using RPG II, and will probably have worked in a manufacturing environment.

Commencing salary will be dependent upon age and experience, and the company offers a wide range of benefits, including 28 days' annual holiday, and contributory pension scheme with free life assurance benefit.

The starting salary will be enhanced by a comprehensive range of fringe benefits and candidates can look forward to a progressive and exciting future.

Ref. W4/2007

MANAGEMENT & EXECUTIVE SELECTION

COMPUTER WEEKLY, July 20, 1978

telephone 01-637 9611

COMPUTER ENGINEERS

Strike while the iron's hot!

Despite many successful placements I still have many vacancies for engineers all over the country. Mini/mainframe/peripheral/comms. engineers, either trainee or experienced, are needed by my clients for field service or site work.

The list below must be brief, so ring me today and find out the full story!

MIDLANDS/SOUTHAMPTON/NEWCASTLE/LONDON
Field Service — Mini and Peripheral up to £6K package + car

LONDON
Site — Comms Field Service — Mini trainee up to £7K package + car Field Service — Peripheral up to £9K package + car

BRISTOL/MIDDX/LONDON
F. S. & Site — IBM 370 series up to £12K package + car

HERTS
Design Engineers Micros up to £6½K (car neg)
For a service you can recommend — contact Peter Gorton.

MANAGEMENT & EXECUTIVE SELECTION

SOFTWARE PROGRAMMERS

Lead the field with the manufacturers!

DO YOU have a good background in assembler, machine code, or specific high level languages on mainframe or minis? Any assembler would be useful and if you have already worked on Software Development so much the better. Are you also outgoing, confident and ambitious because there are other openings in sales support roles for you. These positions should all have been filled yesterday — so phone me today.

DORSET

Fortran, Macro, Coral useful

to £6K

HERTFORDSHIRE
Coral or Assembler for Exec & Telecomms

to £7K

SURREY
Basic, Assembler, Fortran for mini and micro

to £7K

BERKSHIRE

Coral, Algol for Real-Time. Relocation paid

to £6½K

LONDON, NORTHANTS, BIRMINGHAM £neg
Assembler, Cobol, Fortran, Coral

Contact Derek Pearson

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

PROGRAMMERS

SLough

Our Client, a busy engineering company, is currently developing several on-line real-time applications.

If you would like:

- * To receive training in advanced IBM software,
- * Develop COBOL programs involving database and TP systems
- * Work on a variety of applications projects

* Five weeks' holiday a year.

* Excellent starting salary and conditions of employment

* To join an active sports and social club

— and you have a minimum of 12 months' COBOL programming experience, then this could be a good opportunity to accelerate your career.

Ref. W3/2007

1 YEAR COBOL?

BEDFORDSHIRE

£4,500

Our Client, a highly successful Company enjoying an upward trend in trading, is seeking to invest in more top class programmers.

The Company has established a good Data Processing Department and now wish to expand the systems development and so provide a total information centre for the user departments. It is planned that this will shortly relate to on-line systems.

Programmers with at least one year's commercial experience using COBOL and wishing to join a team working in this rapidly expanding environment are invited to apply.

With housing being both plentiful and realistically priced, this is an ideal opportunity for the career minded person to establish themselves with a Company which offers good career progression opportunities and a comprehensive relocation package.

Ref. W1/2007

24-hour answering service
Please telephone for a confidential discussion or write to:

30 Fleet Street London EC4Y 1AA
01-353 0981

The University of London Computer Centre provides a regional computer service to the University of London and to Universities in the South East and South West of England. The Centre is equipped with Cray-1 Data 7600, 6600, 6400 and CYBER 72 computers, and supports a large communications network of over 50 remote terminals and 30 keyboard terminals.

TELECOMMUNICATIONS

A Senior Analyst/Programmer

is required to join a team engaged in the design, development and maintenance of telecommunications systems. An exciting programme of development is planned which includes a major commitment to networking and new protocols.

Applicants should be educated to degree standard and have several years of experience in assembly language programming and telecommunications software.

SYSTEMS

Two Programmer/Analysts

are required to join the operating systems team which is responsible for the development and maintenance of the SCORL 2.1.4 and NOS/BE operating systems.

The work is challenging and involves evaluations and implementations of performance and other service improvements. The Centre is preparing plans for upgrading of its equipment: candidates will be expected to participate in any development.

One of these appointments will be made at a senior level and candidates for this post will be expected to have substantial experience in systems programming on a variety of equipment. Candidates with less experience are also invited to apply.

Candidates for both posts should be educated to degree level.

Salary will depend on qualifications, experience and age, and will be on a scale up to £7558 inclusive of London Allowance.

Holidays 6 weeks per year plus Bank Holidays and 5 extra days.

Modern offices conveniently located for London Transport Services and Main Line Stations. Loans made to purchase Annual Season Tickets.

Further details and application forms are available by phoning Veronica Minards on 01-405 8400, extension 230, or by writing to the Secretary, ULCC, 20 Guilford Street, London WC1.

Closing date for completed application forms 7th August.



Senior Analyst

Applications are invited for the post of Senior Analyst in the Computing Services Department. This successful candidate will be responsible for the systems required by the Administration (e.g. Student Records system).

The Polytechnic has recently installed a DEC-20 to replace a 1905E and the Administration programme are currently being converted.

This post will require a good working knowledge of COBOL, preferably gained on DEC-20 or DEC-22 systems. However, knowledge of ICL 1900 COBOL or RPG2 would also be an advantage. It is unlikely that an applicant who has worked for less than three years with COBOL would be considered sufficiently qualified.

Salary: AP6 - £4481-£4781 plus supplement of £312 p.a.

Further details and form of application available from the Assistant Director and Chief Administrative Officer, Trent Polytechnic, Burton Street, Nottingham. Closing date 2nd August, 1978.

**TRENT
POLYTECHNIC
NOTTINGHAM**

**SCOTTISH SOUTH-WESTERN HEALTH BOARDS
INTERMEDIATE PROGRAMMER**
(£64,421-£6,326)

Applications are invited for the above post based in Glasgow. The Board's Computer Systems serve the Argyll and Clyde, Ayrshire and Arran, Dumfries and Galloway, Fife, Western Isles, Health Boards. The Board provides a wide range of financial services and an integral part of its Information Services Division maintains a comprehensive database of information for Health Care, Planning and Management.

Applicants must have at least 2 years' experience of ICL 1900 COBOL and be computer literate.

Knowledge of communications, programming and use of ICL 1900 COBOL would be an advantage.

Application forms and further details can be obtained from the General Office, Argyll and Clyde Health Board, Glasgow House, 100 Argyll Street, Glasgow G2 1AB. Application forms close 28th August 1978.

**Amoco Europe Inc.
Oil Industry Career
for Programmer/Analyst**

We are currently looking for a Programmer/Analyst to join a group of professionals involved in a wide range of commercial applications in the areas of finance, marketing and administration. Our installation comprises an IBM 370/138 operating under OS with tele-processing links to several European centres.

If you are INTERESTED in the "why" as well as the "how" of business and in the concept of following through a problem to its solution then we would like to hear from you.

You should ideally be a graduate with at least three years' programming experience in COBOL and IBM operating systems. However, we would also be interested in hearing from technical programmers who wish to change to commercial applications.

The benefit package will prove very attractive to those earning around £6000 p.a. and will include four weeks' holiday, luncheon vouchers and a contributory pension scheme.

For further information please contact Brian McLintock,

Amoco Europe Inc., 33 Cavendish Square, London W1M 3HF (tel: 01-405 2195).

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Job 11, issue 1

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Mrs. S. Deakin, Personnel Department, AERE, Harwell, Oxon, OX11 0RA.
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CONTACT: IAN GOLD on 01-388 0036.

Applications are invited from programmers with experience of Cobol.

The post offers variety and interest in the preparation and

maintenance of programmes relative to factory office and

management information and control systems.

Computer: Honeywell 200 with disk drives, tape

drives and off-line terminal using MOD. 4 M/S.

Salary: £3,000-£4,000.

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Must have a minimum of 2 years' programming experience on PDP 11 or similar equipment. A working knowledge of RSTS/E and/or BASIC PLUS would be desirable but not essential.

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A minimum of 12-18 months' programming experience is required, ideally in an interactive environment. Familiarity with PDP 11 would be an advantage.

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freelance programmers in the London
area. We are looking for experienced
programmers to work part-time.

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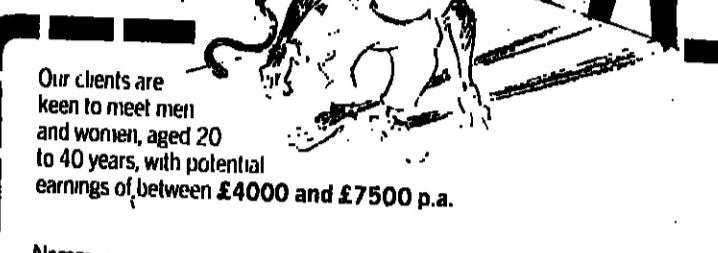
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ONE OF THE WORLD'S LARGEST BANKING GROUPS IS EXPANDING ITS EUROPEAN AUTOMATION STAFF DUE TO THE SUCCESS OF THE INITIAL PHASES OF A SUBSTANTIAL INTEGRATED BANKING SYSTEM DEVELOPMENT PROGRAMME

Opportunities have arisen at three levels:-

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Two positions exist at this level:-

- 1) Within the Systems Management Group responsible for the integrated banking system in six continental European branches. This position will be London based with the advantage of frequent European travel.
- 2) Within the Project Group responsible for the provision of automated systems additional to the integrated banking system. This position will also involve some European travel.

The experience required for these two positions is as follows:

- * Good practical knowledge of International Banking
- * Minimum of three years' systems analysis experience in a banking environment
- * Ability to communicate effectively at all levels
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The successful applicants will be required to become involved in all phases of automation projects.

SENIOR PROGRAMMER ANALYSTS TO £6,500 +

Two further positions:-

- 1) Within the Systems Management Group responsible for the integrated banking system in our London Branch.
- 2) Within the Systems Management Group responsible for the continental European Branches, London based with frequent European travel.

The experience required for these positions is as follows:

- * Minimum of three years' experience of analysis and systems design
- * Solid programming background
- * A good knowledge of mini-computer technology, PDP11 range preferred
- * Experience of BASIC, an advantage but not essential
- * Banking systems experience would be considered an asset

ANALYST/PROGRAMMERS TO £5,500

Positions have arisen at this level within a number of the automation projects. Successful candidates will be able to demonstrate either:-

- a) A good banking background. Previous practical involvement in the implementation of automated systems. A desire to become involved in all aspects of development and implementation.

OR

- b) A sound programming background preferably gained in a banking environment. A desire to extend knowledge and experience into the area of systems analysis, design and implementation.

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CHANGE TO IBM

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A leading manufacturer of equipment for the Print industry winning several Queen's Awards for Industry (in the export market), now requires OPERATORS to join their friendly team running a Century 75. There will be a complete CHANGE OF MAINFRAME to a SYS 3 MOD 15D in the summer, coupled with a move to a NEW COMPUTER SUITE and the introduction of a TP NETWORK.

It is envisaged that the successful applicants will have 6-18 months' experience on NCR equipment and can show the initiative and responsibility to become an integral part of the organisation.

The installation is easily accessible by public transport and a holiday bonus is paid.

Ref. RJ 240.

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Computer Recruitment

Programmers

We're keeping up Croydon's reputation for pace setting developments

From our location at the centre of the Whitgift Shopping Centre, Northern Star Insurance are in the first-phases of an important new development. We've already installed our IBM 370/138 computer. 80 + VDUs will be added during this year and next year. The implementation of our 200 M Bytes On-Line Company Data Base is essential to our planned expansion.

So travelling to work will present no problems. And, in addition to ideal working conditions with a company that is not too big to care about individuals, we offer half-yearly bonuses, a non-contributory pension scheme, luncheon vouchers, and staff club amenities including a licensed bar.

To find out all the details, phone or write now to Mike Buckingham, our Personnel Manager, NORTHERN STAR INSURANCE COMPANY LTD., Rothchild House, Whitgift Centre, Croydon CR9 1NP. Telephone: 01-686 5678 (please reverse the charges).



Northern Star

BOROUGH TREASURER'S DEPARTMENT: Senior Systems Analyst

Salary up to £8,248 p.a. inc.

An Senior Systems Analyst (male or female) you will be the project leader in the Planning and Technical Services team dealing with a variety of non-financial systems most of which will be new projects. You should be an experienced Systems Analyst capable of undertaking systems design and implementation and User Staff training.

A 38-hour week, with flexible working hours is intended and annual leave entitlement is 27 working days.

For further information telephone: Ray Brown on 01-827 5544 Ext. 324.

For application form apply to the Personnel Officer, Town Hall, Forest Road, London E17 4JF (Telephone: 01-531 8899 - 24-hour answering service).

Closing date: 4th August, 1978.

Please quote Ref. S.1338.

London Borough of

Waltham Forest

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DM - ICL - BURROUGHS PROGRAMMERS

There is a growing demand for experienced programmers in the London area. We are looking for experienced programmers to work part-time.

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REPORT, LONDON W4 8RH



Computing Services Association

For further details or informal discussion, please contact Roger Allington on 01-242 9386 (Mon-Fri), or Bartholomew (01427) 2299 (Evenings/Weekends). Ref. CMS/IRP/RA.

Application form from Borough Treasurer, P.O. Box 4, Town Hall, Report, Hampshire (or telephone Gospal 0207 442 2441-101). Please quote Ref. S.1338.

Gospal Borough Council



11 Stamford House
Stamford New Road
Altrincham
WA14 1BL
Tel. 061-941 4509/061-928 5266

Contract Requirements

£150-£300 per week
(plus expenses where applicable)

ICL

Analyst — 1900 — Newcastle — 3 months
System 4 Programmer — Oxford — 6/12 months
Net III, COBOL Programmer — North West — 3 months
System 4 Usercode Programmer — North West — 6 months
1900 Driver, 2903 — ETS Programmer — North West — 2 months
1900 George III writing heads — North West — 3 months
2900 VME COBOL + IBM experience — Programmer — Luxembourg
(October Start)
1900 Plan Programmers — Scotland — 3 months
2950/60 COBOL Programmers — North West — 6 months

OTHER

Singer 1500 Programmer — North West — 4 weeks
Analyst H/W 68 — Newcastle — 6 months
Singer System 10 — various — 3/6 months
O + M Analyst H/W 68 + 1900 — Newcastle — 6 months
Hewlett Packard 3000 + Image database — North West — 8/12 months
Coral Programmers — North Sea Oil Rigs — 6 months (2 wks onshore/2 wks offshore)
Varian COBOL + DAS Assembler — North West — 3/6 months
Dibol Programmers — North West — 3 months
RSX II — Software/Message Switching — London — 9/12 months
Level 80 CMAP — Scotland — 3/6 months

All of these contracts start within the next 2 weeks (except where stated).

For more details of these and other requirements please contact:
Sue Davies or John Christian on the above office numbers.
Tel. Evening/Weekend
Sue — 061-707 1580
John — Rochdale 64726

Emp. Agency Licence No. NW418



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IBM Assembler — PL/I Programmers, £300+ p.w.
IBM Cobol / Assembler Programmers, £375+ p.w.
IBM OS/VS Systems Programmers / Analysts, £325+ p.w.
IBM OS Operators, £200+ p.w.

PERMANENT

Holland (H) / Belgium (B)
IBM OS/VS Systems Programmers (H), £13,000+
IBM MVS Systems Programmers (H), £15,000+
Mini Programmer / Analysts — Consultants (H), £8-£16,000
Burroughs Systems Programmers, Algol (B), £13,000
Operators — Large Multiprocessing Systems (B), £7,000+
We always assist with relocation, and expenses, and provide help in finding suitable accommodation whenever possible.

Telephone Bill Seymour on
01-637 5001 to discuss



Computer controlled telephone exchanges UK and Holland

A recent large order from Saudi Arabia for the manufacture and supply of computer controlled telephone exchanges has confirmed Philips' position as one of the world leaders in this field.

This, plus enhancements and additions to the range of switching systems has created vacancies within the international development team working on these systems. Opportunities exist at the UK base in Malmesbury, Wiltshire, where laboratories of Philips Telecommunications and Pye TMC are located and at the Dutch headquarters of Philips Telecommunications in Hilversum.

The development effort extends into the fields of space and time division switching, local and trunk applications, the integration of microprocessors and network maintenance and management centres.

The following staff are required to work in the area of real time telephony application, basic operating system design and general support tools.

Software Systems Designers

At least 4 years experience in real time or control systems software design is essential. Telephony or telecommunications experience would be an advantage.

Systems Programmers

At least 2 years assembler language experience is required. Experience on small computers and/or control systems would be advantageous.



Project Managers, Systems Analysts, Cobol Programmers Amongst the best opportunities in Essex!

Chloride Automotive Batteries is the largest and most successful British manufacturer of lead-acid batteries. As part of the International Chloride Group we offer excellent experience and promotion prospects.

The company has announced its intention of replacing the ICL 1902S at Dagenham with a 2900 series and to embark on a new and substantial systems development programme. It will cover new real time systems in the commercial manufacturing and financial areas, using the latest communications and data base techniques.

Benefits include a good salary, contributory pension, life assurance and sick benefit scheme, four weeks holiday, subsidised staff restaurant, active sports and social club and generous relocation assistance if needed.

Applicants should telephone or write for an application form to M. Berry, Personnel Department, Chloride Automotive Batteries Limited, Chequers Lane, Dagenham, Essex RM8 8PX. Tel: 01-592 4680.

Cobol Programmers

With upwards of 2 years' 1900 cobol experience, A knowledge of Plan, Driver or George II would be an advantage.



I require urgently
PROGRAMMERS

with one year's IBM Cobol, unlimited prospective to £5,000 p.a.

Interviews any time, anywhere

01-505 5576
24 hours

PROGRAMMERS AND ANALYST

Circle £2,000 to £5,000 negotiable

We are an established software house in commercial publications, and require the following staff to work on visible reports and mini computers.

ANALYST — having one year's systems practice in addition to sound programming background.

PROGRAMMER — having at least one year's programming experience.

JUNIOR PROGRAMMER — having up to one year's programming experience.

TRAINEE PROGRAMMERS — having completed a university or technical college course in computer science.

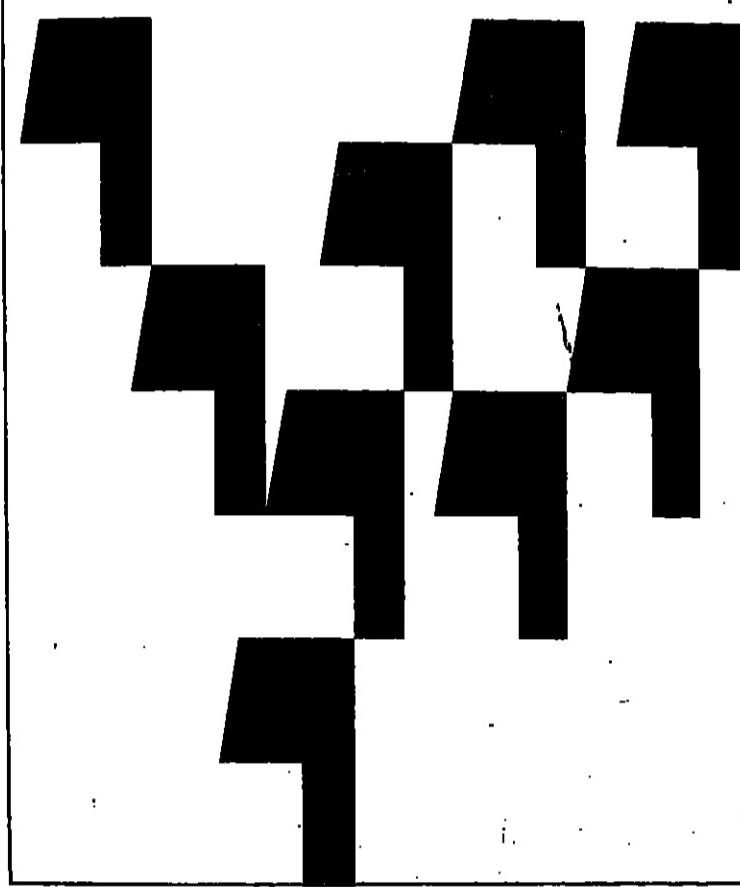
Applications in writing stating full details of experience, employer, age and salary to:

Lindall Ltd.,

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£6000-£9000+

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Logica is already active in the rapidly developing field of data-bases and systems security. We are keen to recruit more senior staff with experience in:

- data-base administration
- particular packages especially Codasyl, IMS, TOTAL, ADABAS, mini-computer based systems
- data integrity & recovery
- data management in distributed systems
- systems security especially audit

You should have worked in one or more of these areas and be keen to develop your experience by solving problems for Logica's clients in the UK and overseas. You will also need the personality and ability to communicate effectively with all levels of technical and managerial staff. Based in central London you will have the opportunity of working with other experienced and highly motivated staff. We would expect you to contribute to the development and growth of these dynamic business areas.

Arrange a meeting with one of our senior professional staff by calling Paula Freed on 01-637 9111, or write to her for an application form — Ref. S36/A, Logica Limited, 84 Newman Street, London W1A 4SE.

Systems Performance Measurement & Simulation

Logica's computer performance analysis have pioneered measurement and simulation techniques since 1969. Demand for our services is such that we need to recruit, staff with general experience in:

- systems programming especially IBM VS, Honeywell GCOS, ICL 2900 VME
- use of hardware or software monitors to tackle performance problems
- capacity planning (sizing) using simulation

If you're good, we can help you go further



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Salary £4,400 p.a. (inc. shift allowance)

Due to further expansion, experienced operators and control clerks are required to join our efficient and hard working Operations Team.

The configuration consists of two large ICL System 4/728 plus VDUs and RJE's.

Ideally, applicants should have two years' experience on either System 4 or IBM 360/370 machines and a good knowledge of JCL.

Three-shift working is in operation in both the Computer Room and Control Department.

A 3½-hour week is worked plus four weeks' holiday after one year's service.

Our office is located very close to the main-line station, (London 43 minutes and Brighton 15 minutes).

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Computer Data Processing Ltd.
Oakfield House
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Haywards Heath
Sussex
Telephone: Haywards Heath 59188

HALTON BOROUGH COUNCIL CHIEF FINANCE OFFICER'S DEPARTMENT COMPUTER SECTION

An Order has been recently placed for an ICL 2904 with Discs, Magnetic Tapes and DDE to replace the present ICL 1901 installation and is due to be commissioned in the Autumn. It is envisaged that future developments will cover a wide range of applications including on-line systems.

SENIOR ANALYST/PROGRAMMER

Grade AP6/801 £4,773-£5,568

Applications are invited for the above posts from persons with several years systems experience using Discs and Tapes and a programming background which includes COBOL. The successful applicant must be able to take charge of a system from investigation to implementation and be capable of negotiating with User Departments. A knowledge of ICL 2903 job control language and direct data entry equipment is desirable but not essential.

ANALYST/PROGRAMMER

Grade AP3/5 £3,732-£5,073

Applicants must have at least one year's COBOL programming experience using Discs and Tapes and a minimum of 1 year's systems analyst work.

The above posts are based in Widnes, and a system of flexible working hours is in operation.

The Council will be willing to pay an appropriate casual reasonable removal expenses and make available accommodation to the successful applicant.

Applications in writing, giving details of age, qualifications, experience, together with the names and addresses of referees, should be forwarded to the Head of Personnel And Management Services, Halton Borough Council, Municipal Building, Kingsbury, Widnes, Cheshire, WA8 7QF. Closing date 21st July, 1978.

R. Turton
Chief Executive

COURSES

University of Bradford DEPARTMENT OF COMPUTER SCIENCE SRC SHORT DURATION COLLABORATIVE TRAINING AWARDS (SDCA) 1978

The Department has in conjunction with RAYTHEON LTD a project proposed on the Improve 80. Applications for Students will be considered by SRC on the Application stage. If successful the application may take up the Studentship in October 1978 for a period of up to 18 months.

The project is:

Title: A computer retrieval system suitable for adult libraries. The system will be interactive containing over 100,000 references. The main focus of the retrieval package will be to be:

- (a) compact size
- (b) overall low cost
- (c) high degree of user participation
- (d) ease of portability

Interested candidates should contact Professor G. R. Head, Department of Computer Science, University of Bradford, BD9 4JL, Tel: 0535 54400 Ext: 4222 or 4223.

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The emphasis is on Development and On-Line work. It is moving through On-Line Order Entry to a Stock Control System, and Production Control, using an ICL 2904 and RPG

The Analyst, who will be based in Kings Norton, will need System 3, 32 or 34 experience. He will be responsible to the DP Manager and will be liaising at Director level.

The Programmer, who must have 2903, 4 or 1900, and On-Line experience, will be based at Redditch.

For both positions RPG III is a must.

PHONE BILL BYRNE ON 01-439 8299
(REVERSE CHARGES)

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Up to £250 p.w. with E.M.S.

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Packages to £7,500 + O/T pay

The E.M.S. consulting group has a large quantity of vacancies throughout the North West region. Candidates should have a minimum of 2 years' systems experience and preferably although not essential, past programming experience. Our major current requirements are for both Analysts and Senior Analysts to work on commercial systems development. Projects will include Ledger Systems, Stock Control, Warehousing and Distribution Chain Store Systems, Database and Network Systems. Ability to work in conjunction with client team members and maintain a high professional standard will be important. Relocation assistance will be paid where appropriate. Telephone our Birmingham Data Centre urgently for early interviews on 021-454 7908 (Denis Fibby/Don Philp). Please complete the attached application form in addition and return to Newcastle Staffs today. Over 20 current vacancies are available at very attractive salary levels.

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To £8,500

We currently have a large volume of vacancies throughout the Birmingham and West Midlands regions, including a wide variety of new jobs at the ready, expanding E.M.S. Data Centre. COBOL and ASSEMBLER programmers should complete our application forms today as an urgent priority. We have an unparalleled range of vacancies interesting and challenging vacancies within our Turnkey Systems Division for candidates seeking the opportunities of constantly working on new development projects within a modern, attractively furnished Data Centre. Interviews are held daily at the Data Centre — Why not come along to discuss your career development projects within the Midlands? E.M.S., as the largest recruitment consultancy in the country, has opportunities available for O.T. staff which are unrivalled throughout the Midlands. Equally, please do not hesitate to complete and return today the attached application form. For only a few minutes initial correspondence the lucrative career opportunities will be forthcoming for you to make your time worth the investment. Consultant Don Philp / John Wood.

TOP SALESMEN AND SALES MANAGER

10K-20K (and it is earnable)

E.M.S. is planning substantial further development of both our Consultancy and Turnkey Systems Divisions during the coming months. Our Consultancy activities extend across all mainframe ranges and encompass a wide range of industrial/commercial organisations. Applications must, therefore, provide as high level Business Analysts capable of rapidly assessing clients' requirements and proposing relevant solutions where appropriate or quantifying the relevant consulting experience required in either systems or programming and providing the necessary staff from E.M.S. resources. A vast potential market exists for salesmen marketing resource support.

Equally, our Turnkey Systems Division provides total U.K. coverage.

marketing Honeywell Level 6 mini-computer systems and supporting software to a wide range of U.K. users. Experienced Salesmen capable of developing their own territories are urgently required. A substantial quantity of leads are also supplied by extensive and vigorous advertising campaigns and Road Show ventures. Salesmen must possess an adequate mini-computer knowledge for Turnkey Systems positions. Cars will be provided with adequate base salaries and high prospective incentives. Apply by telephone for interview during the next week at our Birmingham Data Centre. All U.K. territories will be controlled from the Consultant John Wood.

We have many contract vacancies advised each week. Telephone now for a Contractor's profile form urgently and we will offer you an unrivalled selection of opportunities each month. Even if you are not available for a month or two, register today and let us reserve top opportunities for you to be phased on to later. Telephone 0782-623665 (10 lines). Don Philp, Don Walklate, John Wood, Selina Mills.

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61 Lower Street
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Telex: 36636**Project Leader**

c.£7000 plus mortgage subsidy

Grindlays Bank Group is a British-based international Bank employing 13,000 people in 35 countries. EDP has long been critical to our efficient operation; we are currently extending the UK and international applications of our 370-based configuration and we need a man or woman to join us as Project Leader.

A background in a financial environment and at least two years' relevant experience including some project responsibility is essential. Analytical ability and leadership are essential personal characteristics — and the ambition to realise the very substantial career potential of the job. Although London-based, there will be the opportunity for overseas assignments. Excellent remuneration package includes a salary of around £7K, mortgage subsidy and non-contributory pension scheme.

This appointment offers the chance to join a small team developing and running a sophisticated financial management system. Career potential is substantial within the DP area and the International organisation.

Please write to:

Grindlays Bank LimitedR.J.E. Barker, Appointments Manager,
Grindlays Bank Limited,
36 Fenchurch Street, London EC3.**LONDON BOROUGH OF BARNET Borough Treasurer's Department****COMPUTER STAFF**

This is a large Authority currently operating an ICL 1803T under George 3 running a variety of batch and terminal work and a comprehensive on-line enquiry system. We are upgrading to an ICL 2980 in September. Training in ICL 2900 and VME/B will be provided. There are vacancies for —

TECHNICAL SUPPORT TEAM LEADER

Grade P018 — £5346 to £5858 p.a. inc. (ref. 246)

Responsible for control and motivation of a small team responsible for telecommunications and software usage and development.

This is a new appointment and we are looking for a person with at least 7 years' computing experience in systems and programming who has played a major role in implementing an on-line system using ICL 1800 equipment and communications facilities.

The appointed person will play an important part in transferring and setting up the new computer and will be expected to take an active part in on-line systems currently being developed.

SYSTEMS PROGRAMMER

Grade P01 — £5317 to £5853 p.a. inc. (ref. 251)

A computer professional with at least 5 years' programming/systems experience to work in a small team designing and supporting application systems.

A computer related degree or the NCC Certificate in Systems Analysis would be an advantage.

SYSTEMS ANALYST

Grade AP1/5 — £5108 to £5356 p.a. inc. (ref. 258)

A person with at least 2 years' experience in programming/systems analysis to work in a small team designing and supporting application systems.

A computer related degree or the NCC Certificate in Systems Analysis would be an advantage.

PROGRAMMER

Grade AP1/5 — £5108 to £5356 p.a. inc. (ref. 258)

Two years' experience in 1800 Cobol and/or PL/I required to assist in developing and maintaining a wide range of applications including conversion to 2980.

COMPUTER OPERATOR

Grade C.8 — £3838 to £4218 p.a. inc. (ref. 271)

Duty involved: performing routine tasks in a user installation and data drive. Batch work being converted to run under 03/04 evening shift. The operations staff work two shifts — day 07.45 to 15.45 hours; evening 18.15 to 23.15 hours. Additional shift allowance payable.

Separation allowance payable up to six months, or longer in exceptional cases. 100% of removal expenses, interest free loans for the purchase of annual or six monthly season tickets, additional leave at public bank holidays.

Application forms available from Room 48, Borough Treasurer's Department, Town Hall, Hendon, London NW4 4BG. Telephone 01-202 8202 ext. 120, quoting reference number of post applied for. Closing date 4th August.

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POSITION	SALARY	EMPLOYER	LOCATION	HARDWARE ENVIRONMENT	SOME OF THE QUALIFICATIONS	REF. NO.
Scientific/Technical Programmers	To £7,000+	Technical Consultancy	Various S. of England	Minis/Micros	Scientific/technical programmers with minimum 2 years' assembler and preferably ALGOL, CORAL, FORTRAN, urgently required to work on a wide variety of projects. Excellent career prospects.	26/1
Standards Officers	c £6,500+	Insurance	Essex	IBM OS	Unusual senior post for a self-starter with programming and analysis experience to develop and control standards covering all aspects of Data Processing including Operations.	26/2
Analyst/Programmers	£5,000+	Financial Services	London	Univac	Programmers with 2+ years' COBOL and preferably some FORTRAN needed for interesting development work using DB/Real Time/Batch processing.	26/3
Systems Analysts	To £10,000+ TAX FREE + ACCOM. ++	Bureau	Saudi Arabia	IBM DOS	Systems analysts with commercial/financial experience required for development projects. 1 year+ renewable contract available. Interviews in London.	26/4
Analyst/Programmers	To £8,000	Manufacturer	Middx.	Minis	Excellent opportunities for programmers with 2 years+ commercial experience to work on a wide variety of projects in this successful organisation.	26/5
Systems Analysts	c £6,000+	Engineering Industry	London	ICL 1800	Unusual opportunities for Analysts with 2 years+ experience to join a progressive organisation with challenging and unusual systems requirements.	26/6
Project Leaders	To £7,000	Chemical Industry	Middx.	IBM OS	Urgently required — DP professional with systems experience, a programming background and some supervisory experience to lead teams developing DB and TP applications.	26/7
Graphics/Communications Staff	c 50,000 guilders	Service Industry	Holland	Minis/Micros	People with engineering/graphics/CAO communications experience required for exciting development work based in Holland.	26/8
Programmers/Senior Programmers	To £7,200+	Software House	London	Any	This rapidly expanding software house has vacancies for programmers with 3 years+ experience. COBOL essential. IBM background and 2nd language preferred.	26/9
Software/Systems Programmer	To £11,000 TAX FREE + ACCOM. ++	Construction Industry	Saudi Arabia	DOS/VS POWER	Systems programmer with 3 years+ experience urgently required to maintain and evaluate software in this multi-national organisation. 1 year renewable contract.	26/10
Contract 1900 COBOL Programmers	£180 p.w. +	Software House	Central London	ICL 2900	Urgently required — ICL 1900 COBOL programmers to work on development projects on the new range machines.	26/11
Software Technicians	To £7,000 +	Electronic Engineering	Surrey	Any	Openings for professional staff with a bias towards engineering to work on advanced avionics systems in a company at the front of these advanced developments.	26/12
Programmers and Analysts	To £6,500 + benefits	Travel Industry	N. London	IBM	Opportunities for IBM COBOL/Assembler programmers and analysts with accounting experience to join this exciting travel organisation.	26/13
CAD/CAM Specialists & Analysts	At neg.	Equipment Manufacturer	Holland		Urgently required — CAD/CAM specialist with knowledge of numeric control to provide consultancy services to clients throughout Europe.	26/14
Programmers Junior and Senior	To £8,000 +	Electronics Industry	Surrey	Minis/Micros	Programmers urgently required with Assembler, Fortran, Algol, Cobol, or Coral experience to work on exciting scientific and technical applications.	26/15
Programmers/Analysts	To £6,000 +	Banking Services	City	POP11	Excellent opportunities for programmers with sound programming experience to develop real time communications systems in a banking environment.	26/16
Senior Analyst/Project Manager	£12,000++ TAX FREE + ACCOM.	International Airlines	Middle East	IBM DOS VS POWER	Extensive experience of airline schedule planning. Previous experience of operational research is essential and a statistical background a distinct advantage.	26/17
Programmers/Consultants	To £8,000 +	Software House	Surrey	Various Minis/Micros	This rapidly expanding consultancy requires staff at all levels to work on advanced software/technical applications in the area of communications, real time, process control and basic software.	26/18
Analyst Programmers and Software Programmers	To £8,500 + benefits + bonus + relocation exp.	Stockbroking	Kent	IBM DOS/VS	Programmers with PL/I, Assembler experience required to join this expanding organisation using COBOL and SHADOW. Excellent opportunities for career progression.	26/19
Technical Writers/Instructors	c £7,000 + car allow. ++	Manufacturer	N.W. London	Minis	Unusual career opportunities for DP professionals with commercial experience to work in the educational/technical writing field for a major UK manufacturer.	26/20
Analyst/Programmers	To £7,000 +	Service Organisation	London	POP11	Excellent career prospects for Analyst/Programmers with 2 years+ experience of BASIC+ and RPL3 to work on a wide variety of applications.	26/21
Analyst/Programmers	To £6,000 +	Software House	Surrey and SE	Minis	Programmers with 2 years+ POP11 required to work on a wide variety of commercial systems. System 3 background preferred. Excellent prospects for promotion.	26/22
Contract Staff	£180 + p.w.	Software House	London and South	All	Programmers with COBOL, DAL, PL/I, PLAN, BASIC+, DAP 16, in a wide variety of machines urgently required.	26/23

TOP EUROPEAN COMPUTER MANUFACTURER

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Our Client, the major UK manufacturer of mainframe and mini computers, are looking to significantly expand their activities. The New Business Sector with offices in North, South and Central London, Southampton, Bristol and East Anglia is seeking to recruit additional high quality sales executives.

The New Business Sector handles amongst other equipment the most successful range of small to medium-sized computer systems ever designed and produced in Europe, winning awards for product design and export achievement. The organisation has invested large sums of money in providing education and training, preventive and remedial engineering as well as excellent software support and implementation services. We believe this to be vital for successful selling.

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Successful candidates should desirably have the following attributes:

- ★ At least 2 years' experience in selling of computer hardware, software or bureau services
- ★ A desire to sell in a new business environment
- ★ Ability to communicate with top level management
- ★ Ambition and self-motivation

Not only does our Client offer an excellent basic package which could be as high as £15,000 (commission is payable over and above the guarantee), but there is also a professional management structure with a well designed career path. The normal benefits attributed to a major organisation are available together with a very generous car allowance.

Interested applicants should contact Roy Highfield and interviews will be arranged as soon as possible.

**HUTTON EXECUTIVE SELECTION LTD.
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Ref. CW 37/1
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Hutton
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PETTER REFRIGERATION LIMITED

The data processing department provides services to three Petter companies, on our Hamble Site. Each of these companies has embarked on a comprehensive system development programme using communications equipment.

We now have vacancies for

Chief Programmer

Responsible to the D.P. Manager for all programming activities on the site. Applicants should have in depth experience of I.C.L. utilities, systems programming, modular programming, structured design techniques and of 1900/2904 hardware.

Senior Programmer

Responsible to the Chief Programmer, with similar experience of the equipment and techniques detailed above.

Analyst/Programmer

To join our operations support team which entails user contact and responsibility for the enhancement of a wide range of applications systems.

Programming is in Cobol but some knowledge of PL/I and/or RPG2 would be advantageous especially for the Analyst/Programmer position.

The department runs a 2904 with tapes, large and small discs and communications equipment. Further hardware is on order.

Attractive salary and conditions of employment will be offered and will include pension and life assurance schemes.

Applicants, both male and female, should apply to: The Recruitment Manager, Petter Refrigeration Limited, Hamble, Southampton SO3 5NQ. Tel: Hamble (0421 22) 2061, Ext. 337.

PETTERS



dr DATA RECOGNITION LIMITED
Loverock Road, Reading, Berkshire RG3 1DX

Have you considered changing to Sales?

WE NEED experienced systems or O & M personnel to train as sales executives to manage UK territories in the North and South West — and we are prepared to pay for the right people.

WE'RE IN the source data capture business and manufacture the leading European optical mark reader, the DATATEM 3, together in most circumstances it is the salesmen's essential link between "desk evaluation" and, the first face-to-face contact with the potential client. In fact, the first telephone call to a prospect is, with the exception of the final close, the most important contact of all. If you get it wrong, you don't even get into the action, which, from a negative standpoint, is marginally preferable to getting into the action and losing the business.

THE JOB is for energetic people with disciplined minds, who are capable of meeting the challenge of selling systems. WE'RE NOT RIGID about age and qualifications, but the preferred range is 25-35, and applications from experienced computer industry salesmen are welcomed.

IF THE JOB appeals to you, please telephone our Commercial Manager, Michael Hunt, on Reading 598511 or write to him.

approach depends on the type of company and industry involved, but more often than not it is advantageous.

What must be avoided at all costs is selling the product over the telephone!

It is so easy to get drawn into a sales presentation over the telephone when the prospect's response takes the form of a question. What is it? How much? Why should I? etc. The salesman has to be prepared for this and make it clear that the real benefits of his product can only be assessed once he has a real understanding of the prospect's business, and that is the reason for the suggested meeting.

If the salesman is selling a process control system, for instance, and addressing himself to the chemical industry, then his approach, which might also involve an initial letter, might be as follows:

Good morning Mr Prospect. My name is Fred, salesman from the Electronic Computer Company.

Our process control system is bringing about considerable savings for a large number of chemical companies in both batch and continuous-flow production.

I would like to meet you to discuss the ways in which we could provide similar benefits to your company. Would you prefer to see me next week or the week after?

It's always a good idea to end with an "assumptive optional close" so that the prospect is perhaps persuaded to decide when he should see the salesman, not if he should see him.

A device which has served me well in the past is to agree a "finishing time" as well as a "start time" to the proposed meeting.

Suggest 45 minutes or whatever minimum is appropriate. This way the prospect will know what kind of time commitment he is agreeing to and will consequently be more relaxed and more inclined to say yes.

There are three other points to bear in mind. Firstly, the level of initial contact is often the highest point in the company hierarchy that the salesman will achieve, so he must make sure it is at the decision level, and that normally means the managing director.

Second consideration is whether the salesman can overcome the "protective secretary".

Thirdly, start with a KISS. Keep It Simple. Stupid. Otherwise, it could be the "Kiss of Death" for new account sales.

TRADER

Puzzle answer

THE three "Intervals" between the four original figures — 345, 391 and 437 — must obviously be exactly divisible by the mystery number. So must the two intervals between the first three intervals, both of which total 46.

Now since the first four figures are mixed odd and even, the divisor must be odd if the remainder is constant.

Most salesmen seem to find it easier to handle this situation by prefacing the telephone call with a letter covering items one and two. In my experience, this

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for more information or send the coupon below for immediate attention

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Position Required (Concurrent Permanent delete)	Areas Preferred: First Choice
From	To
Mth / Year	Mth / Year
Hardware	Operating Systems / Software
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Date	Signature
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- * Salaries to £3860 plus overtime
- * Move up to ICL 2960
- * Good promotion prospects
- * Generous relocation expenses

Hunting Engineering Limited is a prominent member of the UK defence industry. As such it can offer new challenges to experienced computer staff. Due to exceptional growth they will be installing an ICL 2960 system in August to operate alongside a 192K 1903T. The operating system is George II+ and you will also gain familiarity with DME, VME/B, Maximop and TPS 1900. A three-shift system operates during the week with ample opportunity for overtime at weekends. The company will give full training on 2960 and has a career development policy which rewards ability by fast promotion to senior grades. So if you have an eye to the future, you should call Sylvia Walton right away or write to.

Castle Computer Services Limited
271 High Street, Berkhamsted, Herts, HP4 1BW Phone: (04427) 73151

ata Computer Recruitment

A division of ATA Selection and Management Services, recruitment consultants to Industry and Commerce since 1962.

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Our clients, a major engineering group, require the following staff for their Head Office at Glasgow and also at the Headquarters of one of their main subsidiaries located in Leeds.

GLASGOW

SENIOR SYSTEMS ANALYSTS

£4,800 to £6,500 p.a.
Three years' experience in a production environment and be preferably Requirements Planning oriented.

v ACCOUNTING SYSTEMS — Applicants should have a sound commercial systems background and have implemented at least one major financial system.

v GROUP SYSTEMS ANALYST — Initially working on Financial Systems for the smaller companies within the Group, experience of Integrated Accounting/Fixed Asset Systems would be beneficial. As this position involves user contact throughout the U.K. some travel is envisaged.

v TECHNICAL SUPPORT ANALYST — to assist in assessing the forward development requirements for Computer Hardware within the Group. Applicants should have a good mainframe experience.

v TRAINEE SYSTEMS ANALYST — Open to applicants with a minimum of twelve months' Systems/Programming experience and should have a degree in a relevant discipline.

LEEDS

SYSTEMS ANALYST

To £5,800
The Analyst will be involved on Accountancy-based systems linked to the Group's Financial Systems. It is however expected that he/she will cover multiple tasks and gain valuable all-round Systems capability.

SENIOR PROGRAMMER/ANALYST

To £5,500
To implement RJE and Terminal Enquiry Systems between the Group's major Yorkshire plants. Applicants should therefore have experience of Data Communications.

Excellent career prospects can be expected within Group Management Services and normal large Company benefits are offered including excellent RELOCATION EXPENSES.

For further information on the above positions telephone: 031-226 5381 (Scotcar, Circutel), Vitac to: ATA COMPUTER RECRUITMENT, Alpila House, 28 Frederick Street, Edinburgh EH2 2JR.

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July 1978

COMPUTER CAREERS IN SINGAPORE

WITH

SINGAPORE AIRLINES



The Company currently operates three large scale IBM 360 computers which will be progressively replaced by newer and larger computers beginning this year. Many new real-time and batched applications are being planned for implementation in the next few years. To cope with this expansion we need several computer professionals to join the Company's data processing team.

Singaporeans and Malaysians are invited to apply for the following positions

APPOINTMENT

SENIOR SYSTEMS ANALYST SENIOR SYSTEMS PROGRAMMER

SYSTEMS ANALYST SYSTEMS PROGRAMMER

DATA BASE ADMINISTRATOR COMMUNICATIONS ENGINEER

University Graduate with at least two years' experience in systems and programming work.

Salary will be commensurate with qualifications and experience with the salary scale \$1050 x 60 - \$1850/\$1725 x 75 - \$2400 per month. Attractive fringe benefits include:

- * Free travel on company services during annual leave and concessionary travel on attractive terms on other carriers;
- * Free medical and dental treatment; and
- * Annual wage supplement equivalent to one month's basic salary.

A team will be in London during the last week of July, 1978, to conduct interviews.

Interested eligible applicants should contact

Administration Department
SINGAPORE AIRLINES LIMITED
580-588 Chalcroft High Road
London W4
Tel: 01-895 4901

for an appointment. Applicants should bring their letters of application and relevant documents to the interview.

REQUIREMENTS

University Graduate with at least two years' experience in computer and/or communications work.

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Salary will be commensurate with qualifications and experience with the salary scale \$1050 x 60 - \$1850/\$1725 x 75 - \$2400 per month. Attractive fringe benefits include:

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Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 7 (The Blocking Factor)
HEX AND CLEO have stolen the mobile of the eccentric James Hock, leaving him spluttering in the ditch, and are now on their way at top speed to a rendezvous with Asci in San Giuse.

As they approached the city the comments from the robot drivers of the hover-transports which they overtook became more and more ribald. They realised that they couldn't risk getting stuck in the city's automatic traffic control system. Fortunately the research establishment was situated some way out of San Giuse, so they decided to take a detour avoiding the town centre.

They came to the southwest corner of the compound just before sunset, free-wheeling the last 400 metres. There they dumped the bike under a bush — doing their best to camouflage its presence. Asci was waiting for them, exactly as planned. It was a beautiful evening, warm but not hot, with a gentle breeze ruffling Cleo's hair. They sat concealed by the undergrowth awaiting darkness and listened to the chirruping of crickets.

When it was dark, Asci chewed a hole in the fence. They left him there to guard their exit and walked stealthily to the central piazza. There a fountain played, lit up by many coloured lights from under the water. A few groups of androids laughed and chatted at tables around the pool, relaxing after a hard day's coding. Hex and Cleo strolled up to an unoccupied table and sat there inconspicuously. After they felt they had merged into the background they got up as casually as they could and sauntered over to the large sliding glass doorways.

"Lambda has a cell in C wing," whispered Cleo as they strode into the hall and towards the lifts. They had wanted to wait for an empty one, but a robot saw them coming and held the doors open.

"Which floor?" he asked politely.

"Floor D please," replied Cleo immediately. Hex breathed a sigh of relief inwardly: she had remembered not to use decimal.

The journey seemed endless. Neither could think of anything to say to the robot, who for his part stood inscrutably by the elevator controls. At last they stepped out onto the plush carpets of the thirteenth floor.

Cleo led Hex quickly past rows of doors, each identical save for a machine-readable bar-coded nameplate. Eventually she knocked on one. A few moments later it was



opened by a young female android. She looked similar to her sister but somewhat older, fuller and altogether more womanly — making Cleo by comparison seem a little skinny. Hex liked the look of her at once.

"Cleol," she exasperated. "What are you doing here?"

"No time to explain. Can you tell us where Zap is?"

"He's probably in the machine room."

"Could you lead us there?"

"Just a minute," said Lambda, eyeing Hex suspiciously.

"Who's this?"

"Don't worry," replied Cleo. "He's just the Hexadecimal Kid."

The door slammed in their faces.

"Come on," pleaded Cleo. "don't be like that."

"Go away," came Lambda's voice from inside.

"Please."

There was a pause. Hex glanced anxiously up and down the corridor. Then Lambda opened her door again. "Do you realise I could be decompiled just for speaking to you?"

"We need your help," said Cleo. "We're going to set up a resonance movement."

Lambda shook her head but said nothing. In the end she

relented. "All right," she sighed. "You're mad, but you are my sister."

Stomaching Cleo's effusive thanks, she led them to the fire escape stairs. They clanked down fourteen flights of steel spiral stairway to the basement, then along to a pair of swing doors marked "Machine Room: No Admittance." Lambda pushed them apart.

Sitting inside at the console was a dark skinned android wearing a knitted woollen cap and sun glasses. He was too immersed in what he was doing to hear their entrance. As they approached him, Hex could overhear what he was saying to the VDU.

"Pow! Another Klingon bites the dust. Phasers locked on target. Fire the photon torpedoes!"

Zap jumped up, pushed his shades over his forehead and shook both of them by the hand. "Man! So you're the Hexadecimal Kid. We've been hearing plenty about you lately."

"They want us to leave with them right now to form a rebel group up in the hills," stated Lambda with disapproval.

"Leave?" demanded Zap. "You must be joking: I still have five Klingon warships to destroy." With that he turned back to the display tube and they watched with fascination but also mounting anxiety as the huge starships hurtled across deep space only to explode in multi-coloured pyrotechnic fireballs when Zap's simulated photon torpedoes struck them amidstships.

When he had saved the galaxy he rose and turned to his audience. "I wrote that Star Trek program myself. It's so good I can't bear to leave a game unfinished," he announced modestly.

"We want you to help us crash the System," said Hex.

"Okay. Let's go."

"You're willing?" asked Lambda, incredulous.

"Sure. Why not? Sounds like a bundle of fun."

There was no time for further discussion. They retraced their steps to the ground floor where Lambda pointed out a fire exit.

"Don't come with us now," suggested Hex. "You can use the main entrance. Why don't you go back to your rooms, collect what you need, lock your doors and meet us outside? We'll wait near the front gate."

The others agreed, leaving Hex and Cleo to stalk across the grass to the waiting Asci. Then they went over to the bush where the motorbike was hidden, congratulating themselves on how smoothly it had gone.

Suddenly the beam of a headlight sliced the darkness, temporarily dazzling them.

"I've got a bone to pick with you."

It was James Hock, sitting on his bike again, with a law enforcement robot on either side.

"Will Hex get zapped? Has Zap been Hexed? No prizes for guessing the answers."

© 1978, Richard Forsyth, RAIR Timosharing.

PROLOGUE NEWS

Expanding CS/40 disc capacity



THE maximum disc storage capacity of Data General CS/40 business computers has been increased nearly 20 times with the introduction of 96 and 190 Megabyte disc drives.

Data General quotes 296,250 for a CS/40 Model C4 with one 96 Megabyte disc store, four video terminals, a magnetic tape drive and a 300 lpm printer. A C8 system with two 190 Megabyte disc stores, eight 190 Megabyte disc drives, a magnetic tape drive, one 96 lpm printer and a 300 lpm printer costs £28,790. The main software feature of the CS/40 is interactive Cobol.

Data General Ltd (CW), Westway House, 330 Ruskin Road East, Greenford, UB6 9BH. Tel: 01-578 0231.

Tapetrap can be programmed to automatically stop recording transmitted data when a certain sequence of characters is detected. The sequence can have up to 16 characters and can be a polling sequence, a special message or an error routine.

A 1,280-character VDU can be supplied with the system to examine data that may indicate the nature of a communications problem.

Tapetrap can handle a four-track magnetic tape cartridge that can store one million data and control characters. This is equivalent to a full hour of data communications traffic at 2,400 bits per second.

Cole-Electronics Ltd (CW), 83 Lower Coombe Street, Croydon, CR9 1AA. Tel: 01-688 6922.

In addition, a built-in acoustic coupler and modem enables test programs to be sent over standard telephone lines at rates up to 8,000 baud asynchronous and 56K baud synchronous.

The Soft Plotter comes on a single printed circuit board and connects directly to the mini-hard copy plotter interface.

Based on a tailor-made 16-bit chip that is similar in power and architecture to the LSI-11, the GR-2225 has 182 fully programmable driver/sensors that are expandable, guide-probe diagnostics, six user power supplies, magnetic tape program storage, a paper strip printer, keyboard, alphanumeric display and a built-in digital multimeter.

In addition, a built-in acoustic coupler and modem enables test programs to be sent over standard telephone lines at rates up to 8,000 baud asynchronous and 56K baud synchronous.

GenRad Ltd (CW), Bourne End, Buckinghamshire, Tel: 0628 26611.

FROM GenRad is a portable service tester for field service diagnosis of printed circuit board faults. Named GR-2225, the maker claimed that it would reduce stocks of spare boards as the repair "pipeline" would be restored.

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